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DSH ABSTRACTS

Volume 1 OCTOBER, 1961 Number 5

CONTENTS

DSH ABSTRACTS

DSH ABSTRACTS

HEARING

Anatomy and Physiology

1328. ALTMANN, F., and BASEK, M., The finer structure of the human stapes. *A.M.A. Arch. Otolaryngol.*, 73, 1961, 507-512.

Microscopic examination of 113 temporal bones cut in serial sections, and of 25 additional isolated stapes, showed that the description of the histological structure of the stapes given by Oesterle is correct. The stapes is composed mainly of skein-like bone with an inner layer of cartilage on the footplate and an upper layer of cartilage on the capitulum. There is a thin layer of periosteal bone on the convex surface and less regularly also on the concave surface of the crura. The amount of periosteal bone present on the crura is not, as in rabbits, dependent on the presence of long-lasting middle ear infections. Deposits of periosteal bone on the tympanic surface of the footplate are rare, always small, and are evidently caused by middle-ear infections. The somewhat greater tendency of the periosteum covering the footplate than that covering the crura to new formation of bone is shown by the clinical observations during revision of stapes mobilizations, where re-ossification of footplate fractures is occasionally seen. The lack of bony callus formation in crural fractures is well demonstrated in an anterior crus examined 7½ months after fracture. There are great differences in the tendency to new formation of periosteal bone between different species of animals and man. Great caution must, therefore, be exercised in drawing conclusions regarding the human stapes from the results of experiments in animals. *(Authors' summary)*

1329. BÉKÉSY, G. V., Pitch sensation and its relation to the periodicity of the stimulus. Hearing and skin vibrations. *J. acoust. Soc. Amer.*, 33, 1961, 341-348.

It has been suggested that the nervous system of the ear is capable of identifying the periodicity of a complex sound, as such, isolated from other factors. Because many phenomena in hearing have their counterparts in the vibratory sensations of the skin, the question is analyzed whether the skin also is able to identify and isolate periodicity of the stimulus. Since a phenomenon described by Seebeck 100 years ago seems to provide the best demonstration of periodicity perception in hearing, an analogous phenomenon on the skin has been investigated for both mechanical and electrical stimulation. The skin too showed the Seebeck phenomenon. But it became obvious that on the skin it is possible to change the periodicity without altering the "pitch sensation" or to change the pitch sensation without having modified the periodicity. The pitch sensation for complex sounds and complex vibrations is probably not a simple process. *(Author's summary)*

1330. BÉKÉSY, G. V., Concerning the fundamental component of periodic pulse patterns and modulated vibrations observed on the cochlear model with nerve supply. *J. acoust. Soc. Amer.*, 33, 1961, 888-896.

Seebeck demonstrated that there are series of clicks for which Fourier analysis shows a very small fundamental component or none at all, in spite of the fact that a distinct tone complex close to the fundamental component can be heard. Similarly, in a modulated tone, the modulation frequency as such may be heard without being present in the Fourier analysis. This paper shows that on the model of the cochlea the artificial basilar membrane vibrates at the place corresponding to the absent fundamental or the modulation frequency. The vibration seems to be a consequence of the complicated traveling-wave patterns and their interferences. This may be of interest for some hearing theories. *(Author's summary)*

1331. DEATHERAGE, B. H., Binaural interaction of clicks of different frequency content. *J. acoust. Soc. Amer.*, 33, 1961, 139-145.

Results from previous experiments have suggested the notion that the neural information for the lateralization of brief sounds comes largely from the basal turn of the cochlea. An examination of that

notion which uses stimuli at the two ears of different frequency content shows that the relation is not so simple. When stimulus clicks to the two ears are identical, then approximate simultaneity places a unitary click-image in the center of the head; and when the stimulus click to one ear differs only moderately in frequency content from the click to the other, then a single click-image is still heard but the stimulus click of high-frequency content must be delivered later than the low-frequency click in order to place the image in the center of the head. If the frequency difference is great, however, a unitary click-image is no longer heard. Instead, the sound breaks up into two images, one of high and one of low pitch, which may be independently brought to the median plane of the head by appropriate adjustment of the interaural temporal relation of the dichotic stimuli. Current auditory theory about localization and pitch neither predicts nor accounts for the presence of two such images. *(Author's summary)*

1332. FRANZ, H., Hat der Musculus stapedius eine selbständige Funktion? (Does the stapedius muscle have an independent function?) *Zeit. Laryngol. Rhinol. Otol.*, 40, 1961, 208-215.

Various theories concerning the function of the stapedius muscle are considered in the light of the findings in patients with facial nerve paralysis. The stapedius muscle cannot have an independent function, as it is an integral part of the ossicular chain. The question of its function can only be studied along with the whole sound conducting system. In peripheral facial nerve paralysis, the hyperacusis and often-present loss of hearing point more to a participation of the cochlear nerve than to the failure of the stapedius to function. *(Author's summary)*

1333. GOLDBERG, J. M., and NEFF, W. D., Frequency discrimination after bilateral ablation of cortical auditory areas. *J. Neurophysiol.*, 24, 1961, 119-128.

The purpose of this experiment was to test frequency discrimination after combined removal of auditory areas I & II, posterior ectosylvian gyrus, somatic area, insular-temporal cortex and the suprasylvian gyrus and somatic area. Seven cats were trained in a double-grill box to make a conditioned avoidance response to a change in frequency of a pulsing tone. The stimulus tones were generated by a loudspeaker. It was concluded that cats can relearn an auditory frequency discrimination after bilateral ablation of auditory areas I & II, posterior ectosylvian gyrus, somatic area, insular-temporal cortex and the suprasylvian gyrus. The lesion results in the retrograde degeneration of all the medial geniculate body and most of the posterior group of the thalamus. *(M.N.)*

1334. HANSON, J. R. and ANSON, B. J., Development of the malleus of the human ear. *Anat. Rec.*, 136, 1960, 206.

In the 7-mm embryo the mesenchymal primordium of the malleus is a continuous mass with that of Meckel's and Reichert's cartilages, incus and the stapes. As differentiation progresses into pre-cartilage and cartilage, the component parts begin to be distinguishable. In the cartilaginous stage, the malleus is never continuous with the incus, but continuity with Meckel's cartilage is retained. The latter keeps pace in growth with the ossicles to the 18-week stage, when the proximal extremity undergoes deorganization preparatory to conversion into the anterior ligament of the malleus. The anterior process develops independently as a thin rod of membrane bone which unites with the neck of the malleus in the 160 mm (19th week) fetus. The malleus (excluding the anterior process) ossifies from a single center located near the area of junction with Meckel's cartilage in a fetus of 120 mm. Perichondral bone precedes endochondral, except in the manubrium, where perichondral bone is never formed. The manubrium is invaded by endochondral bone which spreads downward from the head, but an outer layer of the original cartilage persists even in the adult. The continual remodeling observed in the incus of the adult has not been observed in the malleus. *(Authors' summary)*

1335. HLADKÝ, R., Klinický význam perilymfatické cisterny. (Clinical significance of the perilymphatic cistern.) *Cesko. Otolaringol.*, 10, 1961, 153-157.

It is our aim to elaborate a suitable method of withdrawing samples of labyrinthine fluids for biochemical biopsy. For techni-

cal and anatomical reasons first the easier task was tackled; i.e., withdrawal of samples and biochemical examination of the perilymph, experimentally in animals and on man. It was revealed that the perilymphatic cistern is most suitable for withdrawing samples of perilymph in man. The problem of the innocuous character of withdrawing samples of perilymph on the activity of the static and auditory organs can be considered resolved. This applies, regardless whether the perilymph is withdrawn from the lateral canal or the perilymphatic cistern. So far it has been possible to estimate the total amount of protein and some of its fractions. So far it is not possible to determine the normal inorganic and organic composition of the labyrinthine fluid. The different and frequently high values of protein found by the authors and referred to in the literature are due to an admixture of blood proteins. After subtracting the blood proteins the amount of protein in the perilymph is substantially lower and the values approach those found in the cerebrospinal fluid (in guinea pigs 30-50 mg. per cent). Because even the slightest admixture of blood in the perilymph causes a marked increase of the assessed values of protein, it is very difficult and somewhat problematic to determine their normal amount. The elaboration of a normal proteino- and ionogram is, however, the basic condition for further evaluation of the results under pathological conditions. Therefore the task for the near future is to assess the normal range of composition of the perilymph in animals as well as in man. Then it will be possible to do the same with endolymph. Therapeutically punctures of the perilymph can be used in Ménière's disease, in tinnitus of inner ear origin and in sudden inner ear deafness. *(Author's summary)*

1336. KIETZ, H. vn, Der Höreindruck bei kurzen tönen. (The hearing of brief tones.) *Zeit. Laryngol. Rhinol. Otol.*, 40, 1961, 112-117.

Three phases must be differentiated with brief tones. (a) Foreign sound elements arise at the moment of switching on and off, whose frequency is higher than that of the test tone. These foreign sound elements only affect the hearing with low frequencies. The "crackle-free switch" thus only affects the hearing in low frequencies. (b) Every brief tone of less than 10 m/sec duration, of whatever frequency, causes a pip with a tonal character. This pip reaches the basilar membrane on the spot appropriate to its frequency. (c) Longer tone impulses result in the pip with a tonal character as well as an impression of the tone itself being heard; its loudness sensitivity is only appreciated after about 100 m/secs. With durations of 15 m/secs the crackle of the pip outweighs any impression of tone. *(Author's summary)*

1337. McDONNELL, M., The effect of anesthetics on recovery from auditory fatigue in the cat. *J. comp. physiol. Psychol.*, 53, 1960, 564-570.

22 cats were used to study the changes in the cortical recovery patterns from auditory fatigue under several different experimental conditions. Results indicated that, at the level of the auditory cortex, it was difficult to secure data from anesthetized animals which compared with psychological data gathered by the classical psychological techniques. Evoked potentials were recorded over the auditory cortex before and after exposure of the ear of anesthetized cats to intense, low-frequency tones. In light Chloralose anesthesia, postexposure enhancement was related to intensity and duration of exposure but there was a decrease in postexposure enhancement with increase in Chloralose. In deep Chloralose anesthesia, postexposure depression preceded enhancement and became more severe as depth of anesthesia increased. Nembutal anesthesia produced postexposure enhancement also but the effects of Chloralose were much greater. The results were related to posttetanic potentiation. *(E.H.N.)*

1338. MILLS, P. J., DERBYSHIRE, A. J., and CARTER, R. L., Changes evoked by auditory stimulation in the EEG in sleep. *EEG clin. Neurophysiol.*, 13, 1961, 79-90.

This study reports a technique called "area-centroid method." (Centroid is that point which, when the total area is placed on a straight line, would be balanced exactly, with half on each side). An EEG pattern can be defined by reference to its amplitude, its frequency and its specific wave-form. A change in EEG pattern must then be a change in one or a combination of these dimensions. The neglected "dimension" of the EEG response, amplitude, is

the main concern of this article. Subjects were males and females between 2 months and 21 years of age. EEG recordings were made between 7 p.m. and 2 a.m. during sleep induced by Seconal. The sound stimuli were clicks. By the method described in this study, responses to click stimuli can be detected within 10 db of the conscious threshold. *(M.N.)*

1339. MISRAHY, G. A., SPRADLEY, J. F., BERAN, A. V., and GARWOOD, V. P., Acoustic cerebellar pathways in cats. *J. Neurophysiol.*, 24, 1961, 159-166.

The purpose of this study was to evaluate certain characteristics of the response evoked in the cerebellar vermis (Snider's area) by acoustic stimulation. The latency and wave forms of the evoked response were compared in anesthetized and nonanesthetized animals and in animals with reversible or irreversible damage to the temporo-parietal cortex. 32 cats were used in the experiments. Their auditory and visual cortex and the anterior cerebellar lobe were exposed in routine fashion. Clicks were produced by applying electrical pulses of 0.1 msec. duration to a loudspeaker. The results support Snider's hypothesis of a dual sensory projection system to the cerebellum. *(M.N.)*

1340. MØLLER, A. R., Network model of the middle ear. *J. acoust. Soc. Amer.*, 33, 1961, 168-176.

The fine-structure acoustic-impedance curve of the ear obtained from normal humans *in vivo is* used to develop a network model of the middle ear. First a model representing the middle ear during stapedius muscle contraction is constructed, representing the middle ear with the stapes blocked. A further development adds a circuit corresponding to the input impedance of the cochlea as seen from the stapes. To decrease the influence of the eardrum itself, the eardrum was coated with collodion. Good agreement is found between the input impedance measured at the ear and calculated from the model over the range investigated, from 200 to 1800 cps. The effect of the collodion coating is investigated and the earlier model is modified to fit the input impedance of the uncoated ear. The agreement is not so good as in the case of coated drum. The reason is suggested to lie in the complicated motion of the uncoated eardrum, which could not be represented by the simple circuit of the model. *(Author's summary)*

1341. ONCHI, Y., Mechanism of the middle ear. *J. acoust. Soc. Amer.*, 33, 1961, 794-805.

On the basis of mechanical and electrical models of the ear differential equations are developed for the mechanism of the middle ear. The impedance of the ear, the ossicular chain, the apparent pressure gain by the middle ear, the impedance of the stapes, and the action of the tensor tympani muscle are all measured and/or discussed on the basis of the models. *(B.A.L.)*

1342. PIRODDA, E., and PESTALOZZA, G., I fenomeni di adattamento nell'apparato uditivo. (The adaptational phenomena in the auditory apparatus.) *Bol. Soc. Ital. Fonet. Foniat. Audiol.*, 10(2), 1960, 213-375.

On the basis of a survey of the literature and their own experiences, the authors analyze the adaptation of the auditory mechanism. They define it as a reduction of the subjective impression of intensity under the influence of a constant sound of medium intensity; this phenomenon only persists for a very short time after the interruption of the sound. On the other hand, auditory fatigue, which has different characteristics, persists much longer. The chapters are entitled psychophysical research, physiological correlation, clinical applications of the tests of adaptation. In this latter chapter a differential diagnostic use of these tests is proposed. 384 references. *(D.A.W.)*

1343. RICE, E. A., and SHINABARGER, E. W., Studies on the endolymphatic dc potential of the guinea pig's cochlea. *J. acoust. Soc. Amer.*, 33, 1961, 922-925.

The effect of loud sound on the endolymphatic dc potential was studied in both normal and hypoxic animals. When the integrity of the cochlear wall was maintained, the endolymphatic dc potential decreased 5 mv with the onset of sound . . . and recovered immediately when the sound was terminated. At intensities of 140 db and above, the dc potential irreversibly decreased. The effect of sound on the dc potential was the same for both normal and

hypoxic animals. A negative dc potential was found in the scala media of hypoxic and dead animals. This potential survived the life span of the post-mortem microphonics. The positive dc potential returned on termination of the hypoxia. *(Authors' summary)*

1344. SELLERS, L. M., The round window. A critical re-evaluation. *Laryngoscope*, 71, 1961, 237-257.

A concept of round window function is presented in which the round window is given the primary role in transmission of acoustic energy to the sensory structures of the cochlea. *(R.G.)*

1345. SMALL, A. M., Jr., and GROSS, N. B., Effect of stimulus rise-time on responses evoked from the cerebral cortex of the cat. *J. aud. Res.*, 1, 1961, 208-211.

Electrical potentials were evoked from the cat's cortex by both pure tones and white noise which were equated in amplitude. The stimuli were presented with various rise times. At short rise times the topical distribution of essentially equal response amplitudes were similar for both types of stimuli. At relatively long rise times the tonal stimuli evoked responses from a more restricted cortical area than did the noise. It is noted that the noise-evoked responses were also elicited from a reduced area relative to that observed when fast rise times were used, but that the reduction was not as marked as the tone-evoked responses. A final observation is made that lengthening the rise time of an auditory stimulus tends to decrease the slope of a response's initial wave front and increases the response duration. The authors speculate that these findings are consistent with a descriptive neurological model which they discuss. *(H.B.R.)*

1346. TOMITS, G. H., and HULLAY, J., Représentation corticale de l'audition et de l'équilibration. Etude par la stimulation électrique du cortex temporal. (Cortical representation of audition and equilibration. A contribution to the problem on the basis of temporal electrical cortical stimulation.) *Acta Med. Hung.*, 16(2), 1960, 199-204.

Observations effected by cortical stimulation of conscious patients with temporal epilepsy, in the course of operation. The auditory cortex extends to the T1 polar region, to a part of T2 (areas 38 and 21). The cortical zones of audition and equilibration are not distinctly separated. The auditory cortex participates in experience and auditory memory; the equilibration cortex participates in percepting recording and memorizing spatial experience and positional changes. *(Courrier)*

Apparatus and Procedures

1347. CLEMENCY, W. F., and GOODALE, W. D., Jr., Functional design of a voice-switched speakerphone. *Bell Syst. tech. J.*, 40, 1961, 649-668.

A new hands-free telephone, known as the 3A Speakerphone System, is described. It provides, by means of switched-gain techniques, almost complete freedom from distant-end talker echo and singing. The gain-switching action is virtually free of clipping or blocking—objectionable side effects that are often introduced with voice control of gain. The switching threshold is varied automatically in accordance with room noise to avoid blocking in the receive channel. Performance characteristics are shown, with particular emphasis being given to the parameters chosen to meet rather stringent performance objectives. *(Authors' summary)*

1348. DAVID, E. E., The reproduction of sound. *Sci. Amer.*, 205, 1961, 72-85.

The author, director of visual and acoustics research at the Bell Tel. Labs, discusses sound from its physical and psychophysical aspects in detail. He also includes a comprehensive discussion of disk, wire and tape reproduction, transducers, and room acoustics. Considerable attention is also given to stereophonic reproduction and listening. All sections are introduced with reviews of the earlier concepts and earlier equipment. *(E.H.N.)*

1349. FRY, W. J., Ultrasound: Its roles in basic and applied neurologic and psychologic research. *Gen. Semant. Bull.*, Nos. 24 & 25, 1959, 16-32.

A general summary of the effects of precisely controlled, high-level ultrasound on the tissue of the central nervous system of experimental animals and humans is reported. The development of appropriate instrumentation is discussed. The limitations

of mechanical devices (neurosurgery of deep brain structures for humans) and chemical agents which utilize the vascular system for study of cerebral functions in temporal and spatial "separable" and "non-separable" brain mechanisms are noted. The use of ultrasound at frequencies ranging from 1,000,000 cps to 4,000,000 cps allows for the production of reversible changes in the tissue components of the cerebral system. The development of ultrasonics for the treatment of specific neurological disorders is expected with improved brain maps. *(J.B.R.)*

1350. GREENWOOD, D. D., Auditory masking and the critical band. *J. acoust. Soc. Amer.*, 33, 1961, 484-502.

Masked audiograms were studied as a function of the bandwidth, level, and frequency of a masking noise. In a reverse procedure, audiograms were determined when a movable, narrow, and approximately rectangular band of noise was used as a signal in the presence of one or more masking tones. In both cases changes in the masked audiograms as a function of bandwidth make is possible to measure critical bandwidth. When masked audiograms were studied as a function of level, discontinuous changes in their height and shape occurred when the masking stimulus reached a certain "transition" level. If masking noises of subcritical or critical width were used, the growth of masking with level contained a discontinuity at a level of the masking stimulus equal to about 50 db SL. An abrupt change in the shape of the masked audiograms occurred at the same level. The change of shape when a *pure tone* was the masking stimulus consisted in the appearance of a "notch" one critical bandwidth above the frequency of the masking tone. Findings associated with the bandwidth parameter suggest interpretations of the critical band and of masking. The changes occurring at the transition level may indicate the threshold of the inner hair cells. *(Author's summary)*

1351. KELLY, J. L., Jr., LOCHBAUM, C., and VYSSOTSKY, V. A., A block diagram compiler. *Bell Syst. tech. J.*, 40, 1961, 669-676.

A computer program known as BLODI (block diagram), which accepts for an input a source program written in the BLODI language, is described. BLODI was written to lighten the programming burden in problems concerning the simulation of signal-processing devices. The BLODI source language corresponds closely to an engineer's block diagram of a circuit and is easily learned, even by persons not familiar with computing machines. The input code consists essentially of designating the connectivity of a number of boxes drawn from an alphabet of about 30 types. These types include amplifiers, delay lines, counters, etc., which are familiar to designers of electronic circuits. The principles of the compiler are explained and applications are discussed. *(Authors' summary)*

1352. KLEY, W., and REINECKEN, R., Drehpendelprüfung. (Eine Drehschwachreizprüfungsmethode des Vestibular-apparates.) (Rotatory test. A method of testing the vestibular system by weak rotational stimulation.) *Zeit. Laryngol. Rhinol. Otol.*, 40, 1961, 68-77.

Bárány's rotatory test employs an unphysiological stimulus. To determine the function of equilibrium a more physiological method was devised, based on everyday life. A rotational technique was used simulating the movements a pedestrian might make while crossing a busy road junction, where he would have to repeatedly look right and left, in order to orientate himself among several streams of traffic. The subjects were rotated in a chair intermittently and consecutively to the right and left. The apparatus and method are described. The optimum values for the rate and angle of rotation, as well as suitable rest periods, were worked out from 125 curves. 25 normal subjects were further tested with these optimum figures (12 turns/min., through an angle of 270°, with a pause of 1 sec.), and the results checked by nystagmography. These results are described and give a useful indication of the likely performance of the organs of everyday life. *(Authors' summary)*

1353. MENDELSON, E. S., Improved method for studying tympanic reflexes in man. *J. acoust. Soc. Amer.*, 33, 1961, 146-152.

This report describes manometric apparatus developed for registering the involun-

tary displacements of the human tympanic membrane during the reflex contraction of the middle-ear muscles. Recent tests with the new method have been uniformly successful in 14 inexperienced subjects, as contrasted with only 20 out of 57 previously. The reflex reactions have also been recorded from subjects who had been judged nonreactors in previous tests. Extensive repetitions of tests on one subject have yielded a close quantitative relation between stimulus and response-index magnitudes. In this set of experiments the stimulus was a click-free tone of 500 cps, graded in steps of 1 db. The threshold sound pressure level was about 111 db, and response magnitude rose in sigmoid fashion with progressively stronger stimuli. *(Author's summary)*

1354. RAAB, D. H., Forward and backward masking between acoustic clicks. *J. acoust. Soc. Amer.*, 33, 1961, 137-139.

The masking of one click by another was studied as a function of the time interval between the pulses. Two-alternative forced-choice procedures were employed to measure thresholds before and after the masking click. Both forward and backward masking were found; the forward effect was more pronounced and longer lasting. Backward masking studied in this way extends beyond what can be explained by peripheral intensity-latency conversions. *(Author's summary)*

1355. REINECKEN, R., Über das unterschiedliche Verhalten des drehpendelprüfungs-nystagmus gegenüber dem während der Drehung registrierten Nystagmus bei der rotatorischen Prüfung. (The differences in perrotatory nystagmus during abrupt oscillations and that observed during the rotatory test.) *Zeit. Laryngol. Rhinol. Otol.*, 40, 1961, 203-208.

The nystagmus produced by abrupt oscillating movements of the rotatory chair ("drehpendelprufungs nystagmus" or DPPN) is assumed to be a perrotatory nystagmus. The relation of this analogue to the perrotatory nystagmus in rotation test was examined to ascertain whether the DPPN phenomenon is a part of the perrotatory nystagmus observed during rotation tests. Percentage differences were compared in abrupt and continuous rotation to the right and left through 270 degrees, three quarters and five revolutions. These comparisons were carried out in 73 subjects. Before comparing the reactions to abrupt and normal rotation an attempt was made to ensure that the reactivity of the vestibular apparatus was the same, or at least similar. This was so in most cases. Comparison of the second half-period with the incipient part of the perrotatory nystagmus in the rotatory test showed many divergencies for equivalent direction and angle of rotation. This demonstrated that in the second half-period the perrotatory nystagmus behaves differently in abrupt oscillation than during ordinary rotation. Comparison of the percentage values for abrupt oscillation with those for the perrotatory nystagmus during rotation through 270 degrees, three quarters and five revolutions showed no agreement of the figures. The behavior of the perrotatory nystagmus during abrupt oscillations was not analogous to that of the nystagmus observed during rotatory tests. *(Author's summary)*

1356. SCHROEDER, M. R., and DAVID, E. E., Jr., A vocoder for transmitting 10 kc/s speech over a 3.5 kc/s channel. *Bell Syst. tech. Monogr.*, 1960, No. 3698, 1-9.

Application of vocoders to speech transmission has been frustrated in the past by two problems. First, a voiced-unvoiced decision and a determination of the voice pitch must be made in the vocoder analyzer. Second, though vocoder speech is quite intelligible, a good deal of the individuality of voices is lost. Recent research indicates that proper vocal excitation for the speech synthesizer can be obtained from a narrow bandwidth sample of the original speech. Voiced-unvoiced decision and pitch measurements are not required. Furthermore, the irregular fluctuations of consecutive voice periods which impart individuality to a voice are preserved by this method. Means for sending 10 kc/s quality speech over a 3.5 kc/s channel are discussed. A laboratory model of a vocoder incorporating a 3.2 kc/s uncoded baseband and six spectrum channels covering the band from 3.2 to 10 kc/s has been constructed. Formal listening tests, based on the method of confusion matrices, indicate a gain both in articulation and reproduction quality. Even more important, this approach appears to be applicable

to vocoders generally. Recent research has shown that a few hundred c/s are sufficient for speech synthesis and that bandwidth compression by a factor between two and four is feasible for telephone-quality signals of 3-4 kc/s bandwidth. *(Authors' summary)*

1357. SMALL, A. M., Jr., and MINIFIE, F. D., Intensive differential sensitivity at masked threshold. *J. speech hearing Res.*, 4, 1961, 164-171.

The purpose of this study was to extend information provided by previous research by obtaining with the Békésy technique JNDs for pure tones at threshold in the presence of a masking noise. From records made with a Békésy audiometer an analysis was made of the magnitude of the pen swings during threshold determinations. Thresholds were obtained from 10 normal hearing listeners as a function of masker level, signal frequency, and attenuation rate. Threshold pen swings became larger as either signal frequency was decreased or attenuation rate increased. Masker level had no significant effect. *(Authors' summary)*

AUDITORY SKILLS

1358. COHEN, A., and FINE, B. J., Auditory discrimination and sleep deprivation. *J. aud. Res.*, 1, 1961, 202-207.

Eight subjects were given an auditory discrimination task four separate times each day during a four-day period in which they were deprived of sleep. The discrimination task required the detection of differences in tonal frequency, intensity, and duration and was of the ABX type. As compared to scores obtained under nondeprivation conditions, significant losses were noted in discrimination which first became apparent after 32 hours of wakefulness. A maximum impairment was noted at 48 hours followed by partial recovery in performance toward the end of the deprivation period. Losses in frequency discrimination were greater than those noted for intensity and duration. This result might have been due to initial differences in the ability of subjects to discriminate these cues. *(Authors' summary)*

1359. CORSO, J. F., The quantal hypothesis and the threshold of audibility. *Amer. J. Psychol.*, 74, 1961, 191-204.

Two experiments designed to investigate the neural quantum theory of sensory discrimination through consideration of the audibility curve for tones of low frequency are reported. The author concludes that although the phi-gamma hypothesis and neural quantum theory of sensory discrimination postulate fundamental differences in discriminatory processes, adequate experimental techniques have not yet been devised which will yield data in support of one theory to the exclusion of the other. *(N.J.C.)*

1360. EGAN, J. P., GREENBERG, G. Z., and SCHULMAN, A. I., Interval of time uncertainty in auditory detection. *J. acoust. Soc. Amer.*, 33, 1961, 771-778.

Three experiments were conducted to measure the decrement in performance that results from uncertainity in the time of onset of a signal presented against a continuous background of noise. The fixed-interval observation experiment was employed. A light defined an observation interval for the listener during which the signal, a tone of 1000 cps, either was or was not presented . . . The signal, when presented, started at an instant randomly selected within the observation interval. Thus, the listener was uncertain as to (a) whether or not the signal would occur in the observation interval, and (b) the onset time of the signal, if in fact the signal occurred . . . The functional relation between the detectability index d_s and the interval of time uncertainty is presented for each experiment. *(Authors' summary)*

1361. EGAN, J. P., SCHULMAN, A. I., and GREENBERG, G. Z., Memory for waveform and time uncertainty in auditory detection. *J. acoust. Soc. Amer.*, 33, 1961, 779-781.

An experiment was conducted to determine how well listeners could judge whether or not a signal was presented in a noisy observation interval which had already occurred. The cardinal feature of the experiment is that the observation interval is not marked off for the listeners until some fixed time after its occurrence . . . From the results of previous experiments on the role of time uncertainty in detection, it appears that a fair portion of the decrement in

performance results from poor memory for the input waveform. *(Authors' summary)*

1362. JEFFRESS, L. A., and TAYLOR, R. W., Lateralization vs localization. *J. acoust. Soc. Amer.*, 33, 1961, 482-483.

The accuracy with which subjects could assign an azimuth position to a sound coming to them over earphones was studied. The subjects did about as well initially as Stevens and Newman's subjects did with an external source, and they showed a small amount of improvement with practice. *(Authors' summary)*

1363. LOEB, M., and DICKSON, C., Factors influencing the practice effect for auditory thresholds. *J. acoust. Soc. Amer.*, 33, 1961, 917-921.

Investigators have reported appreciable practice effects for low-frequency pure-tone absolute thresholds and no practice effects for thresholds at higher frequencies. It was suggested that practicing subjects are learning to discriminate between the signal and a low-frequency physiologic noise. No practice effect was observed at any frequency when thresholds were measured against a background of random noise. This finding would be predicted by the hypothesis advanced. However, efforts to induce a practice effect for a high-frequency tone by introducing a faint, high-frequency narrow-band background noise were unsuccessful. Implications of the findings are discussed. *(Authors' summary)*

1364. O'BRIEN, C. C., Exceptional tonal memory and intelligence. *Percept. Motor Skills*, 12, 1961, 282.

In the general population, approximately a three-tone memory span is the mean for retention. The correlation between tonal memory and intelligence is low and positive. Four subjects found to possess an exceptional tonal memory span of 10 to 12 tones had Wechsler-Bellevue IQ's ranging from 130 to 155. In order to determine whether exceptional span is stably associated with high intelligence, more cases are needed for study. *(A.R.)*

1365. SLIVINSKE, A. J., and HALL, J. F., The discriminability of tones used to test stimulus-generalization. *Amer. J. Psychol.* 73, 1960, 581-586.

Evidence is presented to indicate that the four auditory stimuli which varied in loudness and which Hovland and others have used in their studies of stimulus-generalization, although separated by 50 jnd are not absolutely discriminable. Four other tones, obtained from an equal scale of discriminability which was constructed from a range of stimuli wider than that employed by Hovland were also found not to be absolutely discriminable. Implications of these findings for stimulus-generalization studies are indicated. *(Authors' summary)*

1366. WEBSTER, J. C., Information in simple multidimensional speech messages. *J. acoust. Soc. Amer.*, 33, 1961, 940-944.

In listening to simultaneous pairs of speech messages, each message having four bivariate dimensions, information transmission rates of just under 6 bits/sec can be obtained by an excellent listener. Few errors are made in separating out one of the two messages if the ear of reception or the voice of talker is used as the primary separating cue. If a code sound . . . is used, a few more errors arise; and if voice inflection is used, exemplified by separating questions from statements, many errors result. *(Author's summary)*

1367. WHITWORTH, R. H., and JEFFRESS, L. A., Time vs intensity in the localization of tones. *J. acoust. Soc. Amer.*, 33, 1961, 925-929.

Subjects were asked to match the lateral position of one tone, the "signal," by means of another, the "pointer." The two tones were presented alternately. The experimenter selected a combination of interaural time and intensity differences for the signal, and the subject adjusted the interaural time difference for the pointer until it seemed to him to be in the same lateral position as the signal. Subjects having normal hearing perceived the signal in two places, one strongly affected by the difference of level at the two ears, the other almost wholly dependent upon the difference of time. *(Authors' summary)*

Psycho-Acoustics

1368. HELLMAN, R. P., and ZWISLOCKI, J., Some factors affecting the estimation of loudness. *J. acoust. Soc. Amer.*, 33, 1961, 687-694.

In order to obtain a reasonably unbiased loudness function near the threshold of audibility by the method of magnitude estimation, several possible causes of bias were investigated. The investigation included a comparison between sound pressure level and sensation level as independent variables and a parametric variation of the reference SL and of the reference number. It is established that for certain pairs of reference SL's and reference numbers a reasonably unbiased loudness function can be determined down to a SL of 4 db. *(Authors' summary)*

1369. LEREA, L., An investigation of auditory figure-ground perception. *J. genet. Psychol.*, 98, 1961, 229-238.

An investigation of the performance of exogenous and endogenous mental retardates in an auditory figure-ground listening situation. The exogenous group consisted of 25 subjects with a mean age of 18.5 and a mean intelligence of 6.5 years. The endogenous group consisted of 25 subjects with a mean age of 19.2 and a mean intelligence of 6.3 years. In the experimental condition the subjects were auditorily presented a consonant-vowel combination as the foreground superimposed upon a sample of unintelligible, connected speech serving as background. Immediately following, three comparison stimulus conditions were presented: (a) standard background of connected speech, (b) standard foreground and white noise background, (c) standard background with a different syllable combination. A forced choice judgement was elicited. The mean difference between the two groups failed to achieve statistical significance in the experimental condition. *(J.G.S.)*

1370. LOWELL, E. L., WILLIAMS, C. T., BALLINGER, R. M., and ALVIG, D. P., Measurement of auditory threshold with a special purpose analog computer. *J. speech hearing Res.*, 4, 1961, 105-112.

This paper describes a special purpose analog computer (Vannus I) designed to study evoked auditory responses by gross electrode techniques from the skulls of intact humans. A study of 54 experimental runs with normal-hearing adults is reported. Each subject was exposed to 1024 clicks at 100 msec intervals at six suprathreshold and four subthreshold levels. Silent control runs without auditory stimulation also were employed. Total responses showed a systematic change in the response form with changes in intensity. Total subthreshold and silent control runs were relatively flat and did not conform to the positive response criterion. Individual response patterns showed 54% positive responses, ranging from 24% positive at +5 db to 82% positive at +40 db. There was good agreement between the [per cent] of positive responses on the subthreshold and silent control runs. *(Authors' summary)*

1371. McKENZIE, R. E., The effect of binaural beats on performance. *J. aud. Res.*, 1, 1961, 176-185.

This study investigates the effects of binaural interaction involved in binaural beat stimulation on performance tasks. Subjects were required to take the McQuarrie Test for Mechanical Ability (MAC) and three subtests from the Thurstone Primary Mental Abilities Test (PMA) under conditions of (a) no auditory stimulation, (b) binaural stimulation with a 250-cps tone and (c) binaural stimulation with tones that differed by 8 cps (250 and 258 cps) between the ears. The last condition was designed to produce binaural beats, ostensibly as a result of interaction in the central nervous system. A separate group of subjects was required to perform while being stimulated binaurally with an externally-modulated, beating tone (250 and 258 cps). It was found that auditory stimulation, regardless of type, disrupted performance on the MAC while this was not uniformly true for the PMA. The externally-modulated sound was no more successful in disrupting performance than was the single sound source, whereas the sound causing binaural beats tended to be more efficient in this regard. A theory of nervous system activity disruption by hypersychronous discharge is discussed. *(H.B.R.)*

1372. PRATHER, W. C., Shifts in loudness of pure tones associated with contralateral noise stimulation. *J. speech hearing Res.*, 4, 1961, 182-193.

The loudness change in pure tones as a result of noise stimulation in the opposite ear was measured. The primary purpose

was to compare intrasubject and intersubject variabilities of these loudness change values over five replications obtained for 10 subjects under two conditions: (a) matching for loudness without regard to any pitch changes . . . (b) matching for both pitch and loudness. The experimental parameters were tone level, noise level, and frequency. Results indicated that tone level, noise level, and frequency in the loudness-match condition and tone level, noise level, but not frequency, in the loudness-and-pitch-match condition were factors significantly contributing to the total variance of the loudness change measures (difference in loudness between the standard and variable tones). Subjects were variable within themselves to about the same degree, irrespective of condition. One of the most important findings [appears] to be that of a facilitation effect, that is, an apparent increase in loudness of tone under certain conditions of noise stimulation in the opposite ear. *(Author's summary)*

1373. SCHARF, B., Loudness summation under masking. *J. acoust. Soc. Amer.*, 33, 1961, 503-511.

The loudness of four-tone complexes centered at 250, 2000, and 4000 cps was measured as a function of the over-all spacing, ΔF, of the components, both in the quiet and against various levels of a uniform masking noise. When the masking noise was held at a constant level, the loudness of the complex increased more with ΔF at moderate sensation levels—between about 30 and 60 db—than at either higher or lower levels. Near the masked as well as the absolute threshold, the loudness *decreased* as ΔF was increased beyond the critical bandwidth. Only when ΔF was less than a critical band, was loudness independent of ΔF and was the amount of loudness summation invariant with level. These results support the hypothesis that the amount of loudness summation depends upon the slope of the loudness functions for the individual critical bands that form the complex. *(Author's summary)*

1374. SCHARF, B., Complex sounds and critical bands. *Psychol. Bull.*, 58, 1961, 205-217.

The author reviews studies of the responses of human observers to bands of noise and other complex sounds which led to the measure of what appears to be a basic unit of hearing, the critical band. Four types of experiment in which critical bands have been measured are reviewed: absolute threshold of complex sounds, masking of a band of noise by two tones, sensitivity to phase differences, and loudness. Studies dealing with the relevance of the critical band to the loudness of pure tones, to temporal integration, to deafness, and to speech perception are described. 32 references. *(B.S.S.)*

1375. VOGEL, W., The relationship of age and intelligence to autonomic functioning. *J. comp. physiol. Psychol.*, 54, 1961, 133-138.

36 male subjects were divided in two groups; 18 comprised the younger group which averaged six years of age and 18 comprised the older group which averaged 16 years of age. Each age group consisted of three subgroups of six subjects each; feebleminded, normal intelligence and gifted. Each subject was exposed twice to a sound stressor condition and twice to a cold pressor test condition. The breath rate, GSR, pulse rate, blood pressure and finger volume were recorded. Results indicated that stimulus specificity (the nature of the stimulus) and individual specificity (individual differences) jointly determine autonomic patterns. The GSR differentiated significantly for individual specificity between the normal older and gifted older group. It was also found that younger and feebleminded subjects recover from stressors more quickly than normal or gifted. The less intelligent subjects also make sharper discriminations at the autonomic level between qualitatively different stimuli. *(E.H.N.)*

1376. WARD, W. D., Noninteraction of temporary threshold shifts. *J. acoust. Soc. Amer.*, 33, 1961, 512-513.

A one-hour exposure to a high-frequency noise (2400-4800 cps at 100-db SPL) was (a) preceded or (b) followed by a one-hour exposure to a low-frequency noise (600-1200 cps at 110-db SPL). Although both noises produced considerable temporary threshold shifts at frequencies above the corresponding noise frequency, neither had any effect on the growth or recovery

of shifts produced by the other. It is concluded that the course of the fatigue process at one area of the basilar membrane is relatively independent of conditions existing at other areas. *(Author's summary)*

1377. WARD, W. D., SELTERS, W., and GLORIG, A., Exploratory studies on temporary threshold shift from impulses. *J. acoust. Soc. Amer.*, 33, 1961, 781-793.

The TTS produced by various clicks has the same characteristics as the TTS produced by broad-band noise. Further experimentation using very high level clicks (up to 155 db SPL through a special speaker) showed that there is no temporal conditioning of the aural reflex. *(B.A.L.)*

1378. ZUBEK, J. P., SANSOM, W., and PRYSIAZNIUK, A., Intellectual changes during prolonged perceptual isolation (darkness and silence). *Canad. J. Psychol.*, 14, 1960, 233-243.

Sixteen subjects were placed in a dark and soundproofed chamber for a period of a week or longer. A battery of tests, measuring 11 different abilities, was administered before, during, and one day after isolation. A carefully matched group of 16 control Ss were given the same tests at the same time intervals. The results indicate that there is no significant difference in performance on tests measuring verbal fluency, verbal reasoning, number facility, numerical reasoning, abstract reasoning, space relations, and rote learning. Of the intellectual abilities, only recent memory (recall and recognition) was significantly impaired. This impairment was still present one day after emerging from isolation. Two other abilities, namely dexterity and perceptual ability, were also significantly impaired. *(Authors' summary)*

HEARING DISORDERS

Audiometry

1379. EAGLES, E. L., and DOERFLER, L. G., Hearing in children: acoustic environment and audiometer performance. *J. speech hearing Res.*, 4, 1961, 149-163.

Preliminary to a long-term, nation-wide study of children's hearing problems, an experiment was conducted in acoustic environment control and audiometer modification and performance. It is concluded that rigid criteria be met in the field; that audiometers can be modified to test accurately levels well below the American Standard audiometric zero; that precautions taken to control acoustic environment and to check audiometer calibration before and during use should be an integral part of any measurement hearing program. Mean and median values of hearing levels of children in this study vary with frequency and are more sensitive than the American Standard audiometric zero. A substantial number of otoscopically abnormal ears do not show hearing loss and conversely many ears with hearing loss show no observable otologic abnormality. It is concluded that audiometric testing alone cannot identify physical abnormalities of the ear which may have predictive value. *(Authors' summary)*

1380. FRICKER, H., Zum problem der sprach-audiometrie der dialektsprechenden Deutschschweizer. (Speech audiometric observations among German-Swiss persons using local dialect.) *Pract. Oto-Rhino-Laryngol.*, 23, 1961, 207-212.

Hard of hearing patients speaking Bernese dialect were subjected to speech audiometry using words of Bernese German and classical German. Some of the patients showed better discrimination for the dialect than for the pure language. It is recommended that hard of hearing persons who show considerable loss of speech discrimination for the pure language should also be tested with the local idiom. *(Author's summary)*

1381. NAUNTON, R. F., and FERNANDEZ, C., Prolonged bone conduction: observations on man and animals. *Laryngoscope*, 71, 1961, 306-318.

Lesions of the external auditory meatus and of the middle ear can produce an *absolute* improvement in bone conduction. This was demonstrated experimentally by occluding the external meatus of guinea pigs and noting the increased cochlear response from the round window while sound was delivered to the skull of the guinea pig with a bone conduction vibrator. The effect was particularly noticeable clinically in three patients with bilateral secretory otitis media. *(R. G.)*

1382. NELSON, M., Public school audiometry. *Volta Rev.*, 63, 1961, 282-283, 305.

A detailed explanation of the procedures for screening hearing in a public school. 163 children were tested and 30 required a retest. From the retests it was determined that 21 had normal hearing, three had audiograms that indicated a necessity of medical examination, and six of the children were not able to appear for retests. *(J.B.M.)*

1383. POSPÍŠIL, A., Audiologické problémy před, při a po mobilizaci třmínku u otosklerózy. (Audiological problems before, during and after mobilization of the stapes in otosclerosis.) *Cesko. Otolaringol.*, 10, 1961, 178-182.

The author pays attention to more accurate audiological tests and the audiometric determination of thresholds before and after functional operations in otosclerosis and to the elimination of the more efficient ear by suitable masking noise. Next he deals with the diagnosis of otosclerosis and the differential diagnosis, mainly by means of Gellé's test and Gellé's quantitative test. The possibilities of assessment of improved hearing in mobilization are discussed. Finally the author gives an account of the results of mobilizations in 54 operated on patients at the Prague ENT Clinic during the past four years. *(Author's summary)*

1384. PORTMANN, M. and PORTMANN, C., Place de l'audiometrie objective dans l'enquete fonctionnelle du jeune sourd. (The place of objective audiometry in the functional study of the young deaf.) *Voix du Silence*, 4(1), 1960, 12-16.

The authors specify first of all what "objective audiometry" actually is. They further deal with methods and equipment used, analyze the results obtained, criticize procedure and use the foregoing as an introduction to the subject matter. They state that, when all is said and done, objective audiometry is an excellent thing, but that it has been popularized too rapidly and without sufficient discrimination. It is only too often that R.P.G. psychogalvanic reflex is used by persons who do not realize the difficulties inherent to the method in question. R.P.G. often gives results which cannot be evaluated. In the case of examinations carried out on children it is always necessary to have recourse to multiple tests. To overlook this rule may discredit examination procedures which have been tested and found valid in long months of experimentation, as is the case with R.P.G. audiometry. The audiometric card conditions the orientation to be given to re-education. The outcome is too important and all precautions must be taken to aviod mistakes. The otologist, the educator, the pediatrician who ask for functional examinations do not care about the methods used. What they want are clear results, a level of audition which is valid and which can be used as an absolutely safe basis for therapy and re-education. *(Authors' summary)*

1385. SIMKINS, W. T., An audiometric profile in multiple sclerosis. *A.M.A. Arch. Otolaryngol.*, 73, 1961, 557-563.

78 patients with multiple sclerosis (MS) were given pure-tone air conduction and bone conduction tests. Matched with them was a control group of 83 subjects who were presumed to be representative of a normal population. Median and modal group audiograms, the results of an analysis of variance and theoretical curves are presented. The data show that the MS group had worse hearing in the low frequencies and better hearing in the high frequencies than the control group for the range 125-2000 cps, inclusive. MS patients who demonstrated the suspected curve, 68%; patients who did not show curve, 14%; borderline, 18%. All subjects were within the normal range for 125-2000 cps. The audiometric configurations of MS patients have not been reported previously in the literature. *(J.J.)*

1386. TORRES GASSO, J. Ma., L'audiometrie objective dans les premieres annees de l'enfance. (Objective audiometry during the first years of childhood.) *Voix du Silence*, 4(1), 1960, 23-24.

The author reviews the most efficient ways of rendering objective audiometry most useful during the first years of childhood. He describes the limitations of objective audiometry, its practical possibilities and suggests to integrate and harmonize the various methods used today. To conclude, he states that we must not limit ourselves to one single experiment of objective audiometry, but, rather, that we must carry out all tests so as to arrive

at properly harmonized results. *(Author's summary)*

1387. WATSON, T. J., Objective audiometry in early childhood. *Voix du Silence*, 4(1), 1960, 17-22.

There are a number of tests now available for use with very young children. In many cases they are described as "objective," but this adjective may be equivocal when applied to tests of hearing since the interpretation of the results of objective testing is itself subjective. Most of the objective tests require complex apparatus and may involve unpleasant experiences for the children concerned. There is, as yet, no conclusive evidence that the information obtained from objective tests is more accurate and reliable than that obtained by distracting tests and performance tests of hearing. In view of the incidence of defective hearing in early infancy it is essential that tests of hearing should be made at as early an age as possible. Unless some form of screening procedure is adopted diagnosis will be delayed in very many cases until the child is at least two years of age, during which valuable time will have been lost. A screening procedure has been developed which has proved to be effective for this purpose. It is suggested that the use of this or similar tests be extended as widely as possible in order that defective hearing may be diagnosed during the first year of life. *(Author's summary)*

Auditory Training

1388. BÖRRILD, K., Höretræning med svært tunghöre og döve börn. (The hearing training of severely hard of hearing and profoundly deaf children.) *Nord. Tidskr. dövunderv.*, 2, 1961, 61-78.

The following rules are set up by the author, using Carhart's scheme: (a) the training material should be so easy that the children have a feeling of progress. (b) It must be difficult enough to give them a feeling of accomplishment. (c) An error must be immediately corrected, never permitted to pass. (d) Repetition is necessary. (e) The training should be fun. The author concludes, "We must not risk a Silverman once again saying as he did in Manchester in 1958, 'We want no heart-warming stories—we want facts.'" *(B.J.S.)*

1389. CASTELAO VAZ, L. G., Educação rítmica da criança surda através das percepções sonoras. (Rhythmical training of deaf children through vibratory perception.) *Criança Surda*, 5, 1960, 59-67.

It is necessary to make use of tactile or vibratory sound perception which helps the improvement of the oral language. In order to make [it] possible to give rhythmical training to deaf children, it is necessary to study well not only tactile sensations and perceptions but the tactile-vibrations also. *(Author's summary)*

1390. COSTELLO, M. R., Realistic goals in auditory training. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp. 133-145.

The rewarding results of auditory training in the past have led to this method being used more widely. It has also caused modification and intensification of the methods involved. Recent advances in our knowledge of hearing have provided additional insight into its nature, which has caused established practices to be discarded, but has not provided for the development of an objective and differentiated rationale. Auditory training is ceasing to be a general exposure to sound and is becoming more exacting and scientific based on psychological learning data and better understanding of hearing disorders. *(M.V.)*

Diagnosis and Appraisal

1391. ANON., Ten danger signs of a hearing loss. *Hearing Eye*, 29(2), 1961, 14-15.

The ten danger signals are (a) speech deterioration, (b) fatigue, (c) indifference, (d) social withdrawal, (e) insecurity, (f) indecision—procrastination, (g) suspiciousness, (h) false pride, (i) loneliness and unhappiness, (j) tendency to "hog" the conversation. A brief explanation of each symptom is given. *(W.A.B.)*

1392. BOENNINGHAUS, H.-G., Erfahrungen mit der Stapesplastik nach Zangemeister. (Results of stapes plastics after Zangemeister.) *Zeit. Laryngol. Rhinol. Otol.*, 40, 1961, 41-49.

Results of 21 stapes plastics after Zangemeister are given. This consists of resection of the footplate and the insertion of con-

nective tissue between the oval window and the crura. A well marked improvement in hearing occurred in 18 and was maintained for at least six to eight months. Two cases showed temporary or no improvement, while in one the hearing was slightly worse than before the operation. Tinnitus improved or cleared completely in all 18 successful cases. Vertigo was only very slight. A transient facial palsy complicated one case for two weeks. Further follow-up studies are being undertaken in these cases as well as our more recent ones to evaluate this new method. Theoretical considerations already justify the hope that if improved hearing is maintained for over six months after a stapes plastic, the improvement should be permanent. Later results remain to be seen. The operation is not unduly difficult technically and is already considered to be superior to fenestration of the external canal, and direct or indirect mobilization, with the possible exception of anterior crurotomy in cases where the posterior part of the footplate with its crus becomes mobile. Our experience has so far encouraged us to recommend stapes plastic and we have abandoned other techniques in the treatment of otosclerotic deafness. *(Author's summary)*

1393. BOYD, J., Problems in the diagnosis of deafness in children. *Hearing Eye*, 28(4), 1960, 12-15.

The author presents a brief review of the methods and techniques used in evaluating children's hearing. Concomitantly, some of the problems encountered in assessing hearing loss in children are discussed. *(W.A.B.)*

1394. BOYD, J., Problems in the diagnosis of deafness in children. Part II, Deaf or severely mentally retarded. *Hearing Eye*, 29(1), 1961, 6-9.

The problems of psychological and audiometric testing of the mentally-deviant, acoustically-handicapped child and his physical development as compared to the "normal" child are discussed. Although few suitable tests are available, The Leiter International Performance Scale, The Nebraska Test of Learning Aptitude and The Ontario School Ability Examination have been used to evaluate I.Q.'s of hearing-impaired children. 17 references. *(W.A.B.)*

1395. CONNOR, L. E., Determining the prevalence of hearing impaired children. *Except. Child.*, 27, 1961, 337-339, 341-344.

A representative sampling of the results of studies and surveys of children's hearing impairments in the U. S. during the past three decades reveals wide variation in estimates. A national study of the hearing levels of preschool and school-age children should be undertaken to improve treatment and preventive programs. Cooperative study among professionals in the hearing field could result in standardization of testing conditions, equipment, terminology, and reporting. *(Rehab. Lit.)*

1396. FALTÝNEK, L., Převod zvuku na třmínkovou ploténku při různých formách fixace kůstkového řetězu. (Transmission of sound to footplate of stapes in different types of fixation of the chain of ossicles.) *Česko. Otolaringol.*, 10, 1961, 158-161.

The author presents the results of examinations by means of an auditory catheter in 23 patients with different types of fixation of the ossicular chain. To confirm clinical findings he measured the deviation of the footplate of the stapes in nine fresh preparations of the temporal bone. He reached the conclusion that there is a qualitative difference between the transmission of sound by air and the transmission of sound by the auditory catheter to the handle or the short process of the malleus. Thus it is possible to differentiate between fixation of the malleus and incus and that of the stapes. *(Author's summary)*

1397. GRINGS, W., LOWELL, E., and HONNARD, R., GSR conditioning with preschool-age deaf children. *J. comp. physiol. Psychol.*, 54, 1961, 143-148.

14 profoundly deaf children ranging in ages from two years to six years (mean 44 months); IQ estimates were all within the normal range. The objective was to compare GSR conditionability of a sensory stimulus from a normal modality, vision, and a sensory stimulus from a defective modality, audition. The conditioning series was 25 trials. The visual-conditioned stimulus (CS) was a light and the auditory a 500 cps tone of 100 db delivered through headphones. The unconditioned stimulus (UCS) was a 60 cycle AC current

ranging from .75 ma to 1.6 ma. The CS-UCS interval was five sec rather than the more conventional .5 sec. The GSR magnitude and the rate of response showed a significant increase with greater numbers of paired training trials for light but not for tone. For tone, CS response adaptation occurred. The authors discussed the results in terms of the conditionability of preschool-age children, the effects of the verbal process on conditioning, and the perceptual limitations differentiating deaf and nondeaf children. *(E.H.N.)*

1398. KORKIS, F. B., Recent advances in the surgical treatment of middle ear deafness. *Silent World*, 15, 1960, 4-8.

The author notes that considerable success has been achieved recently by surgery designed to improve or restore sound conduction from the tympanic membrane to the cochlea. He discusses anatomy and physiology, selection of cases for operation, pathology, tympanoplasty, the fenestration operation for otosclerosis, mobilization of the stapes and stapedectomy. He concludes that the various operations which have been discussed are all being continually modified in the light of experience. We have not yet reached the ultimate goal of the perfect operation for all cases of otosclerosis. In the light of our present knowledge the different operations for otosclerosis should be considered as stages in the surgical treatment, beginning with mobilization and ending with fenestration of the labyrinth. *(H.F.S.)*

1399. KRAUS, R. N., Early diagnosis of hydrops of the labyrinth. *Laryngoscope*, 71, 1961, 277-291.

Hydrops of the labyrinth, equated with Ménière's disease, produces a hearing defect which frequently precedes the symptom of vertigo and which can be distinguished from other hearing defects. According to previous reports and to the case presentations here, hearing is usually poorer for lower than for higher frequencies, and is accompanied by complete recruitment, high SISI scores, relatively low speech discrimination, and a low-pitched tinnitus. *(R.G.)*

1400. MAŇÁK, J. Záchytnost a diagnostika otosklerózy v terénní praxi. (Rate of detection and diagnosis of otosclerosis in field work.) *Cesko. Otolaringol.*, 10, 1961, 173-177.

The author presents the results of his experience with the rate of detection and diagnosis of otosclerosis in the Písek district. The analysis pertains to 72 patients (1 promille of the population) recorded in 1953-1960. The author evaluates individual signs of the disease and emphasizes in addition to classical signs of otosclerosis mainly the anamnestic sign of variability of auditory tinnitus. *(Author's summary)*

1401. SIMONTON, K. M., Hearing results after modified radical mastoidectomy. *Laryngoscope*, 71, 1961. 425-433.

Records of 135 patients who underwent modified radical mastoidectomy for relief of chronic suppurative disease of the middle ear and mastoid process are reviewed with regard to hearing results. The incidence of hearing improvement was greater in ears with apparently intact ossicular chains than in those with obviously broken ossicular chains. The study suggests that granulations should not be removed from the ossicles. Suggestions for further critical study of modified radical mastoidectomy are made. *(Author's summary)*

1402. ŠIROKÝ, J., Jednoduché užití zvukově sondy při vyšetřování otosklerózy. (Simple use of auditory catheter for examining otosclerosis.) *Cesko. Otolaringol.*, 10, 1961, 167-172.

The author examined the fixation of the stapes in patients suffering from otosclerosis using the method described by T. Tsonoda. The method is simple and consists of determining the auditory threshold by means of an auditory catheter from the cavum conchae with the auditory meatus free and subsequently filled with fluid (Rivanol solution), whereby the free end of the tube is immersed in the fluid. The author revealed that in people with normal hearing the average difference of thresholds is at a frequency of 125 Hz 24, at 250 Hz 22 and at 500 Hz 18 db. In fixation of the stapes the difference of thresholds is reduced below 15 db and sometimes even to zero. In the conclusion of the paper the author pays attention to some theoretical problems which were encountered when using the "water catheter" as this method was named by the author. *(Author's summary)*

1403. U.S. NATIONAL HEALTH SURVEY, A health inventory of America's young people. *Quart. Rev. Pediat.*, 15, 1960, 60-62.

These data are excerpts of estimates based on household interviews of 115,000 persons living in 36,000 households throughout the nation between July, 1957, and June, 1958. In the category *Defects and Impairments* (e.g., blindness, deafness, paralysis, and missing or deformed limbs), "there were 41.0 impairments/1,000 children less than 15 years old, and 82.8/1,000 in young persons 15 to 24 years old. Serious visual impairments, including blindness, accounted for about 8% of the total in each of the two age groups. Hearing impairments, including deafness, accounted for an additional 15% of all impairments in children less than 15 years of age and 8% in those aged 15 to 24 years. Orthopedic impairments caused 36% of the impairments in the younger age group and 59% in the older." *(R.R.L.)*

EDUCATION

1404. ANDERSON, P., Hovedlinjer i døvlundervisningens historiske utveckling. (Highlights in the historical development of education for the deaf.) Oslo: S. Hammerstad, 1960. Pp 162.

This book is composed of a series of lectures given by the author before the National Training Class for Teachers of the Deaf in Oslo in 1958. The material is presented in a personalized style and covers the commonly known areas of history in European education of the deaf. Much attention is given to the German oral movement as initiated by Samuel Heinicke and as later developed by Fredrick Moritz Hill. The growth of education for the deaf in Norway is discussed at length beginning with the pioneer work of P. A. Castberg, "Denmark's de L'Epee," and his talented deaf Norwegian student, Andreas Christian Møller. It was the latter who became the first teacher of the deaf in Norway in 1825. Oralism was introduced into the country in 1844. The author describes the unique "mouth-hand system" invented by Georg Forchhammer of Denmark. This method involves the simultaneous supplementing of oral speech with a phonetic manual alphabet which represents only the consonants. The vowel elements are sufficiently visible so as to render their manual counterparts unnecessary. *(Edward L. Scouten, Gallaudet College)*

1405. ANON., A primer on hearing. *Spec. Educ. Rev.*, 17(2), 1960, 1-48.

In response to inquiries from parents this handbook contains basic information concerning the nature of hearing; patterns of hearing loss; measurement of hearing acuity; and education of the hearing handicapped. *(M.M.H.)*

1406. BIGMAN, S. K., The deaf in American institutions of higher education. *Personnel Guid. J.*, 34, 1961, 743-746.

In order to estimate the number of deaf students attending schools with hearing students and to obtain a view of their situation in college, two mail surveys were made in 1955. Questions were asked concerning admission policies regarding deaf students, communication skills of the students, academic success and participation in extra-curricular activities. Deaf students were reported in 75 colleges in 30 states. They attended all types of institutions; e. g., large urban, small liberal arts, teachers colleges. Reports from registrars indicated a tendency on the part of some schools to exclude deaf students without proper investigation of the individual student's abilities. The students reported they relied more on obtaining information outside class than on lipreading the instructors' lectures. Considerable variance was found in the academic success made by these respondents and in their extra-curricular participation. *(H.L.L.)*

1407. BOWER, D., Summer fun with numbers. *Volta Rev.*, 63, 1961, 284-286.

This article briefly describes the need for the parents to work with their children at home during summer vacations. The child needs help in developing language, number skills, and concepts. It is felt that with the suggestions given the parents can be creative in helping the child have a better understanding of arithmetic, number concepts, and abstract language. *(J. B.M.)*

1408. BRANDON, W. R., Foreign languages on the college level. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washing-

ton, D. C.: USGPO, No. 62, 1960. Pp 199-204.

The needs of deaf students which are met by foreign language instruction on the college level are discussed. It is felt that foreign language study broadens the student's intellectual horizon by teaching him something about another culture. In the case of the student whose onset of deafness was early in life, study of a second language causes beneficial reciprocal influence on the study of English. *(M.V.)*

1409. ELLIOTT, M., The national college of teachers of the deaf. *Silent World*, 15, 1960, 100-102.

The history and functions of the National College of Teachers of the Deaf are discussed. *(H.F.S.)*

1410. FRENCH, J.R.W., Further education for the deaf in Nottingham. *Silent World*, 15, 1960, 40-43.

A program for the further education of deaf people included in a city Evening Institute Session of six-months duration is described and evaluated. The curriculum was experimental. Emphasis was placed on language, including attempts to increase vocabulary, increase reading ability and increase written expression. Evaluation encourages continuation of the experiment with emphasis on language in the curriculum. *(H.F.S.)*

1411. GANT, J., A transitional social studies curriculum. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf*. Washington, D. C.: USGPO, No. 62, 1960. Pp 209-212.

The article primarily gives the nine steps taken by the staff of the Wisconsin School for the Deaf in devising their social studies curriculum. In general the program itself is based on units or problems in question form from high school down to kindergarten. It expands from the home, at beginning level, to the entire world at the high school range. The trend toward the core type of curriculum is noted. *(M.V.)*

1412. GORSHINA, E. P., Rabota s deformirovannym tekstom i rabota po rasprostaneniyu rasskaza v shkole glukhonemykh. (Deaf school work on jumbled texts and on enlarging sentences.) *Spetsial'naya Shkola*, 98, 1960, 11-15.

Deaf and dumb children have great difficulty in mastering the connection between the words in a sentence and between the sentences in a story. Work on a jumbled text and on enlarging a story will help them overcome this difficulty. By selecting words from a jumbled text and putting them in order, pupils realize that words in a sentence are connected by their sense and must be arranged in a definite order; by deciding the order of sentences in a story, they begin to master the art of expressing thought logically. A series of lessons is outlined in relation to this work. *(H.G.W.)*

1413. HINES, R. C., The teaching of arithmetic. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf*. Washington, D. C.: USGPO, No. 62, 1960. Pp 216-219.

The learning of basic concepts of numbers is seen as a gradual step-by-step process. In the author's experience as a teacher of preparatory students at Gallaudet College, he notes many pupils who have gaps in this continuum which make advanced mathematics difficult. Some of these gaps are pointed out. The need for teachers competent in the subject matter of arithmetic is also discussed. *(M.V.)*

1414. KOMAROVA, E. N., Grammaticheskii razbor kak odni iz vidov raboty po russkomu yazyky v shkole gluchonemych. (Grammatical analysis as one of the types of work on Russian language in a deaf school.) *Spetsial'naya Shkola*, 98, 1960, 16-22.

Grammatical analysis is shown to be valuable in school work for the deaf since it is an effective way of introducing new language material, it helps in the revision of grammatical work already known and helps also to develop logical thinking. Analysis is not to be considered as an end in itself, however, but only a means towards the further development of language and its understanding. Practice material and exercises are outlined for work in Russian schools at various stages. *(H.G.W.)*

1415. MANZHILA, I. N., Informatsii: Soveshchanie v Kieve. (Information: Conference in Kiev.) *Spetsial'naya Shkola*, 97, 1960, 74-78.

A joint conference of Ukraine and R.S.F.S.R. defectologists, held at Kiev from

14-16th May, 1959, discussed the reorganization of special schools and the training of pupils for practical work, in particular. C. A. Zykov, Head of the Section on Surdopedagogics, Institute of Defectology, Moscow, stressed the need for preschool preparation at home or nursery school and for radical improvement in occupational training by increasing hours of manual work and introducing compulsory practical training. Methods of instruction in boarding schools for the deaf should be revised and more attention paid to practical work, supervision and excursions. R. M. Boskis, Director of Section for children with defective hearing, Moscow, pointed out the main peculiarities in mental development of such children, especially in speech development, and outlined the basic principles of instruction. B. D. Korsunskaya, Senior Research Worker at Section on Surdopedagogics speaking on the organization of preschool work in deaf institutions, said the formation of verbal speech must be carried on at the same time as other general educational tasks. She recommended hastening this process by the use of dactylic language, which makes exact perception of words and their reproduction by imitation possible. N. D. Romenko, Senior Research Worker of Scientific Research, Ukrainian Institute of Pedagogy, declared that the essential type of school for the deaf was a polytechnical one with a twelve-year course, corresponding to the eight-year ordinary school with a three-year educational and industrial department for those unable to continue studying after primary school. N. A. Nikashina, research worker from the Logopedics Section, said the structure of a special school for children with serious speech defects must be flexible enough to correspond to the variety of special defects, with two main departments for children with generally undeveloped speech and for those who stammered badly. A teacher from the Kiev Institute, P. G. Kraevskaya, reported on the instruction of mute children, by describing the different types of institution for each type of child, and tried to formulate the general requirements for the syllabus of special schools for children with defective speech.

Another section of reports dealt with the problem of improving the upkeep and instruction methods in special schools. Two speakers, using material from investigations into the development of independent, connected speech of young deaf school children, showed this can be improved by increased attention on the part of the teacher to detailed expressions and by increasing exercises in relating impressions and ideas connectedly. Another speaker reported on a practical system of the grammatical structure of language in a school for those with defective hearing, allowing them to master primary grammatical conceptions in 3 stages: (a) basic grammatical regularities of the language (classes 1-4), (b) main grammatical regularities, (c) general conclusions (classes 5-6). A Kiev teacher spoke of specific training in a second language for classes 9-12 in schools for the deaf.

Reports by research workers from Institute of Defectology, Moscow, discussed methods of widening the vocabulary of young deaf and dumb school children by words useful in daily life and also gave ways of improving the language syllabus. A number of speakers dealt with subsidiary schools: one criticizing sanitary and hygienic measures in occupational training, another discussing methods of encouragement and punishment, a third explaining the methods of selection of children for such schools, while a fourth spoke of the influence of the state of verbal speech on mastery of reading, writing and spelling.

An exchange of opinions on the reports read followed. Those present approved the general trend of reorganization of special schools in the reports, but made many suggestions to broaden the network of such schools, to reduce staff deficiencies, and to improve methods of instruction, the work of the commission on selection of pupils, and occupational training and education of abnormal children. Further systematic conferences of defectologists were recommended to examine the urgent problems of the work of special schools. *(H.G.W.)*

1416. MAY, E., Music for deaf children. *Volta Rev.*, 63, 1961, 220-223, 247.

This article presents the procedure and findings of an experiment to interest deaf children in music. The purpose was to acquaint them with music itself rather than trying to interest them in any area as far as its relationship to speech, rhythm, etc. The program outlines visits to a museum, teaching some specific skills with a rhythm

band, the making of musical instruments and then attempting certain rhythm patterns with the instruments. They learned to read various types of music and to recognize octaves and the keyboard of the piano. They were taught the rudimentary ideas of conducting and learned some history of each instrument. The author found that there were a wide variety of limitations which she kept in mind all of the time. In conclusion, she found that music can be pleasurable and profitable for deaf children, and by acquainting them with certain visible manifestations of general musical culture they can learn the names of some instruments and their functions. She found that percussion orchestras were well suited to and much liked by deaf children and that they provided opportunities for orchestration, conducting, marching, releasing of energy, the development of muscular coordination as well as group experience. She also concluded that the deaf child of normal intelligence can learn to read a percussion score. She felt there was a great need for a good bibliography of music for deaf children and suggested that more articles be written concerning their interest in music. *(J.B.M.)*

1417. MURPHY, F. R., Adapting TV quiz program technique to the classroom. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf*. Washington, D. C.: USGPO, No. 62, 1960. Pp 185-186.

It is pointed out that the techniques used by the TV quiz program can be as effective in the classroom as on the air. The use of the "Tic-Tac-Dough" pattern to develop vocabulary in reading is given as an example. It is felt a new concept that "education is fun" can be developed. *(M.V.)*

1418. MURPHY, F. R., Scientific education. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf*. Washington, D. C.: USGPO, No. 62, 1960. Pp 187-188.

The deaf have possibilities in the field of science as evidenced by the success of certain deaf people in research and the skill of deaf people during World War II in technical jobs. Through individual project methods which stimulate his curiosity, the deaf child can strive to keep up in scientific knowledge. *(M.V.)*

1419. MURPHY, F. R., Mr. Griffing's question of the need for a wholesome sex course. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf*. Washington, D. C.: USGPO, No. 62, 1960. Pp 189-190.

The author's experience in teaching "a camouflaged sex course" involving lectures, questions and answers from the class, and written papers was discussed. On the basis of this experience it is felt such a course has a place in a curriculum. *Blueprint for teen age living* by W. C. Menninger will be the text. *(M.V.)*

1420. O'CONNER, C., and CONNER, L. E., A study of the integration of deaf children. *Except. Child.*, 1961, 483-486.

21 former Lexington School deaf pupils who were attending regular schools with normal hearing children were chosen for evaluation. Their present schools are all in the metropolitan New York area and do not provide any special classes or teachers to the pupils. Each deaf pupil spent a minimum of one year at the Lexington School and all had entered the school during preschool years. The average hearing loss in the speech range in the better ear was 73 db and the average IQ was 114. Results indicated that about half were unsuccessful in their transfer to integrated classes. Children who begin life with an average speech-range loss of 60-70 db cannot successfully integrate educationally with hearing children between the ages of four to six years. Generally, even those children who have acquired facility in the use of language and speech will need specialized programs throughout their educational careers and will not be ready for integration until 8 or 9 years of age. Careful assessment must be made of age, communication ability, intelligence, personality makeup, parents, scholastic achievement, etc. *(E.H.N.)*

1421. PAINTER, A. L., The teaching of social studies to the deaf. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf*. Washingington, D. C.: USGPO, No. 62, 1960. Pp 212-214.

The author submits suggestions for the teaching of history and geography based on his own experience as a teacher. With regard to history he discussed teaching key vocabulary, using maps and pictures, using dramatization, educational films, and the

development of topics. On the teaching of geography suggestions are given on developing vocabulary, using maps and films, and the unscrambling of words. *(M.V.)*

1422. STRENG, A., Children with impaired hearing. Washington, D. C.: Council for Exceptional Children, 1960. Pp 72.

Another of the Council's series of booklets planned to aid the administrator, teacher, or professional worker employed in schools of small communities or rural areas. Miss Streng . . . describes elements of a good hearing program, ways to enlist community support, methods for identifying children with hearing impairments, and types of educational adjustments possible for children of varying ages and amounts of hearing loss. Good supervisory practices and administrative responsibilities in special education programs are defined and illustrated by examples of programs representing different organizational patterns. A brief list of selected references, sample forms suggested for a conservation of hearing program, minimum requirements for clinical certification of speech and hearing therapists, as set up by ASHA, standards of training for teachers of the deaf, and a list of organizations interested in the hearing impaired are given in the appendix. The bulletin is indexed. *(Rehab. Lit.)*

1423. TÜLLMANN, A., Wir brauchen ein Gymnasium für Taubstumme! (We need a high school for the deaf.) *Neue Bl. Taubs.*, 14, 1960, 127-129.

The German gymnasium (approximately equivalent to the American high school plus junior college), with its historical tradition of philology expressing itself in modern language teaching, is not a good type of secondary education for the deaf. The American high schools and the British secondary schools for the deaf with their accent on sciences are better prototypes. It is suggested that a first German gymnasium for the deaf be started in a suitable heavily populated area, with a program which stresses progressive teaching of the German language, plus mathematics and sciences, so as to enable its students to go into such fields as architecture, engineering, professional gardening, biology, chemistry, cartography, meteorology, minerology, etc. *(B.Tb.T.)*

1424. WILLINGHAM, B., A review of what is being done with social studies in the secondary level at the Texas School for the Deaf. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 204-208.

The Texas School for the Deaf has two programs at each grade level, one for the college preparatory group and one for the vocational students. In the beginning home and community life is taught, then the world's geography and peoples, Texas history and geography, civics, and American History in that order. Reasoning, judgment, and discrimination are emphasized throughout. On the functional side Girl and Boy Scout activities are provided and there is a student council. The author includes an outline on how the student council constitution was constructed. *(M.V.)*

Etiology and Pathology

1425. ASLING, C. W., HURLEY, L. S., and WOOTEN, E., Abnormal development of the otic labyrinth in young rats following maternal dietary manganese deficiency. *Anat. Rec.*, 136, 1960, 157.

The otic capsule and neighboring structures have been sectioned serially in normal and [manganese] deficient young rats at varying intervals before and after birth . . . The gross development of the osseous labyrinth was studied by reconstruction . . . Gross alterations in deficient rats included reduced size of periotic (osseous) labyrinth, abnormal curvatures of semicircular canals, and abnormal relationships of ampullae. *(Authors' summary)*

1426. BECKER, W., and MATZKER, J., Akustischer unfall. (Acoustic accident.) *Zeit. Laryngol. Rhinol. Otol.*, 40, 1961, 49-58.

After a short exposure to the noise of a circular saw, two patients suffered a permanent loss of hearing of the labyrinthine hydrops type. An attempt is made to explain the development of this type of deafness on the basis of two previously reported cases by Antoli-Candela and Boenninghaus. Apart from the well known explosive, and chronic noise exposure acoustic traumata, a third type of damage is described, due to a short exposure to constant intensive noise. This is an accidental

rather than occupational disease. *(Authors' summary)*

1427. BULGARELLI, R., Su un problema che è ritornato di attualità : l'azione della streptomicina e della diidrostreptomicina sul nervo acustico. Si deve abolire l'uso della diidrostreptomicina? (A present day problem: the action of streptomycin and dihydrostreptomycin on the acoustic nerve. Should dihydrostreptomycin be abandoned?) *Minerva Med.*, 51, 1960, 2337-2347.

After his own personal experience and data from the literature, Bulgarelli concludes that dihydrostreptomycin should be abandoned, even for short-term cures, and be replaced by streptomycin. One single relative indication: hypersensitivity to streptomycin in tuberculotics, if the other anti-tubercular agents are insufficient. In addition, combinations of dihydrostreptomycin-streptomycin and dihydrostreptomycin with other antibiotics should be abandoned. This attitude has been adopted by the Food and Drug Administration (USA) 13 January, 1960. *(Courrier)*

1428. CARY, F. H., Symptomatic venous hum. *New Eng. J. Med.*, 264, 1961, 869-870.

This is a case report of a 37-year-old woman who had been annoyed by a continuous roaring noise in her right ear for seven years and had recently noted a similar noise in her left ear. She was able to achieve relief by lying down or by pressing the middle of the right sternocleidomastoid muscle. Along with the roaring she had severe occipital headaches and other general bodily difficulties, e.g., increased bowel movements, weight loss and poor appetite. Medical examinations and records indicated other bodily activities within normal limits. A prosthetic device, fashioned by the U. S. Naval Dental School, allowed light pressure over the neck without discomfort. She improved considerably thereafter. *(M.N.)*

1429. CENACCHI, V., and GABRIELLI, L., Considerazioni sulle sordità percettive ad insorgenza improvvisa. (Sudden perceptive deafness.) *L'Oto-Rino-Laringol. Ital.*, 30, 1961, 119-133.

23 cases of sudden perceptive deafness observed during years 1956-60 are reported. Most commonly accepted pathogenetic theories (vascular, infectious, allergic) are discussed. The observed cases are headed under four groups, with regard to their probable pathogenesis. In the first group (12 cases) the assumption is made, on the basis of the following arguments, that acoustic damage be linked to a functional disturbance in the cochlear arterial vessels: (a) the anamnestic data point to a condition of diffuse vascular peripheral involvement, (b) the cochlear accident seems to have been enhanced by a stressing agent such as fatigue, cold, heat stroke, etc., (c) favorable results have been obtained in these cases by administration of vasodilator drugs. In the patients of the second group (6 cases) an organic lesion (hemorrhage, thrombosis) in the cohclear vascular system appears to be the most likely pathogenetic mechanism. The third group concerns two patients whose sudden deafness coincided with an attack of influenza: the viral etiology seems to deserve the best credit, even if laboratory controls could not be performed. In the fourth group have been recorded four cases in which the sudden deafness occurred in young subjects usually practicing subaqueous fishing under apnea, during or shortly after a prolonged immersion. A characteristic feature in the cases of this group is the tendency to reversibility, either spontaneous or following treatment: a vascular functional mechanism is therefore assumed as the most probable pathogenetic interpretation. Physiopathological conditions of vascular system in the above mentioned situation are briefly discussed, as an attempt at a more detailed interpretation. *(Authors' summary)*

1430. CHILARIS, G., and COYAS, A., The occurrence of recruitment in glaucoma patients. *J. Laryngol. Otol.*, 75, 1961, 501-503.

Glaucoma is not a purely local disease of the eyes as proved by clinical data and laboratory experiments. Disturbances of the organ of Corti were observed in the majority of people suffering from glaucoma. There were very few subjective complaints about their hearing. Ramboldi reported, in 1899, hearing disturbances in those persons with glaucoma. Ferraris de Gaspare and Maffei (1951) believe that recruitment is an early warning sign of glaucoma. Henin (1957)

found recruitment present in about 65% of simple chronic glaucoma cases and in 10 out of 11 cases of congestive glaucoma. The author found recruitment present in 58.5% of 70 cases. Recruitment was found to be usually homolateral to the affected eye. It is believed that the lesions in both organs are due to the same pathogenic mechanism. Clinical fact shows that both the eye and the ear react similarly to certain neurovascular disturbances. *(J.G.A.)*

1431. CLOSE, P., and IRELAND, R. G., Alterations in the pure tone threshold following changes in both absolute and differential pressures upon the ear. *J. aud. Res.*, 1, 1961, 194-201.

Pure tone thresholds were obtained from three normal-hearing subjects under conditions of both positive and negative intraaural pressure, while placed in a pressure environment at sea level as well as at 30,000 feet equivalent. The authors report that both positive and negative differential pressures across the eardrum cause a rise in threshold between 100 and 7500 cps. Positive differential pressure caused greater loss in the 100-1000 cps range, with minimal loss from 1000 to 7500 cps. Conversely, negative differential pressure, while causing a similar loss in the low frequencies, produced at least as much hearing loss at high frequencies. The authors point out that the degree of hearing loss varies considerably among subjects at higher frequencies. They conclude that both positive and negative differential pressure across the eardrum, both at sea level and at 30,000 feet elevation, causes hearing loss in the frequency range important for speech, when such pressures do not exceed 10 inches of water pressure. *(H.B.R.)*

1432. ELDREDGE, D. H., BILGER, R. C., DAVIS, H., and COVELL, W. P., Factor analysis of cochlear injuries and changes in electrophysiological potentials following acoustic trauma in the guinea pig. *J. acoust. Soc. Amer.*, 33, 1961, 152-159.

Young adult guinea pigs were anesthetized and the auditory bulla was opened so that electrodes could be placed in the scala vestibul and scala tympani of the basal turn, the third turn, and the helicotrema. Potentials were displayed and measured on cathode-ray tubes. A calibrated 500 cps tone was used to produce acoustic trauma. Histological sections were examined. Physiological measurements, injury ratings, and sound pressures and durations of traumatic exposures were examined for correlations and common factors. Results, which tend to confirm previous conclusions, are presented in detail. *(B.A.L.)*

1433. HLAVÁČEK, V., and CHLÁDEK, V., Konstituční znaky u otosklerózy. (Constitutional signs in otosclerosis.) *Cesko. Otolaringol.*, 10, 1961, 145-152.

The authors discuss the influence of constitution on the development of otosclerosis. Heredity was investigated in 262 cases and hereditary factors were proved in 38%. The more frequent incidence of heredity from the maternal side is in agreement with the more frequent incidence of otosclerosis in women in general. Younger children in the family suffered more frequently from otosclerosis than older children. A family history of alcoholism and mental disease was found in 3%. Anthropometric measurements revealed a shift towards leptosomatic and asthenic types and a decrease of pyknic types. From a total of 274 operated patients, women were 3.35 times more frequent than men. As far as pigmentation is concerned, otosclerosis was more frequent in persons with black hair. The pigmentation of the skin and iris, however, did not differ markedly as compared with the control group. Blue sclerae were found in 13.3%, bone fractures in 15.5%. The first pregnancy reduced hearing in 26.4%, the second pregnancy in 43.9% and subsequent pregnancies in 52%. Reduced hearing occurred usually after childbirth, sometimes in the course of pregnancy and rarely during lactation or after abortion. *(Authors' summary)*

1434. KARELITZ, S., and EISENBERG, M., Measles encephalitis. *Pedriatrics*, 27, 1961, 811-818.

Histories of 42 patients with measles encephalitis are reviewed. Sequelae such as hallucinations, visual deficits, possible hearing loss, intellectual deficits, and epilepsy are reported. *(N.J.C.)*

1435. KONISHI, T., BUTLER, R. A., and FERNANDEZ, C., Effect of anoxia on cochlear potentials. *J. acoust. Soc. Amer.*, 33, 1961, 349-356.

The anterior inferior cerebellar artery of guinea pigs was occluded, thereby interrupting the blood supply to the cochlea. Durations of occlusion ranged from 1 through 60 min. Cochlear microphonics, summating potential, action potential, and endocochlear potential were recorded before, during, and subsequent to occlusion. The differential effect of anoxia on the various potentials was observed, as well as the appearance of the large negative dc potential in scala media as anoxia progressed. For the brief occlusion durations, the amplitudes of all potentials except cochlear microphonics became greater than normal soon after the blood supply returned. Even for the longer anoxic intervals, the summating potential, and the endocochlear potential exhibited supernormality during the recovery process. *(Authors' summary)*

1436. MANSON, M. M., LOGAN, W. P. D., and LOY, R. M., Rubella and other virus infections during pregnancy. *Quart. Rev. Pediat.*, 16, 1961, 57-59.

This study, spanning the years 1950-1953, presents data on 1,513 pregnancies associated with known viral infections and 5,717 infection-free controls. The infections were rubella, measles, chicken-pox, mumps, poliomyelitis, and influenza. When rubella was contracted during the first trimester of pregnancy, there was a higher proportion of abortions, stillbirths, infants who failed to survive to their second birthday, infants of low birth weight, and infants with congenital abnormalities. A "deafness" incidence of 19% is reported for the rubella-during-1st-trimester group, "though the handicap was severe in only a small number of the children affected." Periodic hearing testing was recommended for this group. Rubella contracted after the first trimester of pregnancy had no demonstrable effect on the infant. No incidence of hearing deficiencies was reported for the other groups. *(R.R.L.)*

1437. NIXON, J. C., and GLORIG, A., Noise-induced permanent threshold shift at 2000 cps and 4000 cps. *J. acoust. Soc. Amer.*, 33, 1961, 904-908.

Three samples of noise-exposed males were drawn from noise environments which were steady state and continuously "on" throughout the work day and were essentially unchanging over the exposure range studied. Median hearing levels were compared with exposure time at 2000 and 4000 cps, and it was noted that as SPL increases the median hearing levels show a corresponding increase at both frequencies. The loss expected because of aging was taken into consideration. *(Authors' summary)*

1438. NOVOTNÝ, Z., Neurovegetativní regulace u otosklerózy. (Neurovegatative regulation in otosclerosis.) *Cesko. Otolaringol.*, 10, 1961, 194-200.

Examination of the neurovegetative regulation in otosclerotic individuals, women and men, revealed in most instances an enhanced excitability of the sympathetic nerve and amphohypertonia. In most patients there was a predominance of the tonus of the parasympathetic nerve. Only in one patient was the vegetogram normal. The examined individuals had different occupations, most of them did not perform manual work or only partly manual work. The surgical results were not related to certain vegetative types. The author discusses the problem of the pathogenesis of otosclerosis in relation to vasomotor disorders of the labyrinth and its osseous part. *(Author's summary)*

1439. POSPÍŠIL, A., and NOVOTNÝ, Z., Otoskleróza a hluk. (Otosclerosis and noise.) *Cesko. Otolaringol.*, 10, 1961, 188-193.

The authors present an account of seven cases of otosclerosis (six men and one woman) working under conditions of excessive noise. In three instances not even after prolonged work under these conditions was marked damage in the c_5 frequency and other frequencies revealed. In three instances the otosclerotic individuals were more vulnerable to noise. In one instance no definite relationship between otosclerosis and noise could be established; noise acted similarly as in persons with normal hearing. The authors attempted to explain the mechanism of the action of noise on otosclerosis and their mutual relationship. *(Authors' summary)*

1440. REFSUM, S., Nouvelle étude de l'heredopathia atactica polyneuritiformis. (Heredopathia atactica polyneuritisformis reconsideration.) *Wld Neurol.*, 1, 1960, 334-347.

This curious affection, probably due to the action of an autonomous recessive gene, combines in its complete form: pigment retinitis with hemeralopia and a reduction of the field of vision, polyneritis, cerebellar impairment, hyperalbuminorrachia, ECG disturbances . . . , anomalies (inconstant) of pupillar motility, perception hypoacousia, sometimes anosmia, ichthyotic alterations of the skin and a curious skeletal anomaly consisting of symmetrical epiphysial dysplasia of the elbows, shoulders, knees, club-foot and finally a shortening and widening of the metacarpus and metatarsus. Refsum considers it to be an authentic nosological entity. *(Courrier)*

1441. VENCLÍK, H., Přímé mobilizace třmínku u otosklerózy. (Direct mobilization of stapes in otosclerosis.) *Cesko. Otolaringol.*, 10, 1961, 162-166.

The author presents an account of the results of 72 mobilizations of the stapes in otosclerosis. The early results are: 30.6% no improvement, and 69.4% successful operations. Evaluation after six to 36 months revealed permanent gain in 39%, partial or complete loss of gain in 61%. The author recommends direct mobilization, including the saving of the mucoperiosteum on the surface and circumference of the footplate of the stapes and an enhanced fight against infection and allergy to prevent reactive inflammations and reankylosis. *(Author's summary)*

HEARING AIDS

1442. FRIEDLANDER, D., New type hearing aid invented by two Israeli scientists. *Hearing News*, 29(4), 1961, 7.

This article describes a hearing aid invented for persons who are deaf in one ear. A tiny microphone is used in place of an earphone in the person's deaf ear and by means of a bone conduction transducer the sound is directed to the good ear. According to the author, those persons who hear with only one ear lead half a life. The small microphone in the deaf ear helps to overcome this obstacle. The sound waves reach the good ear a fraction of a second later than the original sound waves reach it, and so the condition for binaural reception, in terms of time and phase delay, difference in amplitude and wave distortion caused by the head, are observed. The results were declared "amazing." The experiments will have to continue before a final judgment is made. The problem of stereophonic or three-dimensional hearing still has to be solved. The inventors believe that training may help overcome this obstacle. *(J.G.A.)*

1443. JERGER, J., CARHART, R., and DIRKS, D., Binaural hearing aids and speech intelligibility. *J. speech hearing Res.*, 4, 1961, 137-148.

The possible advantages of binaural hearing aid use for increasing speech intelligibility is investigated. Two types of measurement, using competing speech signals, were obtained from 48 subjects with sensorineural hearing loss. Subjects were tested with monaural-body, monaural-head and binaural-head hearing aids. A slight improvement is reported in favor of the binaural-head fitting under one type of measurement (Northwestern U. Test #2). The second type of measurement (Northwestern U. Test #3) elicited essentially no intelligibility differences among hearing aid conditions. When subjects were grouped according to severity of hearing loss, subjects with relatively mild loss showed no intelligible improvement when fitted binaurally, while subjects with greater loss exhibited an advantage under binaural fitting. It is concluded that binaural hearing aid fitting offers no appreciable advantage over monaural fitting. *(H.B.R.)*

1444. JERGER, J., and DIRKS, D., Binaural hearing aids. An enigma. *J. acoust. Soc. Amer.*, 33, 1961, 537-538.

Various studies have failed to show any marked superiority of binaural hearing aids over monaural hearing aids in terms of speech intelligibility. One notable exception is a study by Belzile and Markle which demonstrated a marked superiority of binaural aids. The present study replicates the experimental design of the Belzile and Markle study within certain limits but fails to corroborate the previous evidence. It is discovered that in the original study, the monaural aid was placed on the body, whereas in the present study the monaural aid was placed on the head. Binaural conditions had both aids on the head in both studies. It is concluded that one aid worn on the head is superior to one aid worn on

the body in terms of speech intelligibility, but that binaural hearing is not significantly better than monaural, on-the-head amplification. *(B.A.L.)*

1445. KODMAN, F., Jr., Some attitudes of unsuccessful hearing aid users. *Eye Ear Nose Thr. Mon.*, 40, 1961, 405-407.

56 unsuccessful hearing aid users are compared with a like number of successful users by a questionnaire approach. The unsuccessful users wear their aids about three hours a day while the successful users wear their instruments 10 hours a day. Unsuccessful users have many complaints regarding their instruments and frequently manipulate the volume control of their aid. They demand a great deal of follow-up service for their instruments. The study supports the assumption that pride, vanity, and sensitivity are deterrents to acceptance of a hearing aid. Both successful and unsuccessful hearing aid users complain of the poor speech discrimination they have with their aids as well as the purchase price and the design of the instruments. The psychological approach should receive greater emphasis in order to cope with the many psychological and social problems which confront the hearing aid user. *(P.E.R.)*

1446. LAMB, R., Is it only a faulty lead? *Silent World*, 14, 1960, 358-359.

A test panel for locating trouble in certain types of commercial hearing aids was designed. Diagram and list of parts are included. *(H.F.S.)*

1447. McCUE, D., Are we getting the right hearing aid? *Silent World*, 15, 1960, 140.

Two questions are posed regarding hearing aid design and adequacy: "(1) Does binaural amplification give better results than monaural? (2) Does a head-worn unit give better performance than a body-worn unit?" *(H.F.S.)*

1448. MENZEL, O. J., Some aspects of hearing rehabilitation. *Eye Ear Nose Thr. Mon.*, 40, 1961, 208-209.

Rehabilitation of persons with permanent auditory handicaps calls for team effort; the otologist should be responsible for the co-ordination of services and follow-up. The majority of patients can be served adequately by direct referral to the hearing aid dealer; those with anticipated fitting problems should be referred to an audiology clinic if one is available. Criteria to aid in anticipating fitting problems are discussed briefly. It is the otologist's duty to be familiar with currently available hearing aids and community facilities for rehabilitation. *(Rehab. Lit.)*

LANGUAGE AND COMMUNICATION

1449. BERRUECOS V., M. P., and TARASCO C. S., Técnicas de rehabilitación en los problemas de la communicación linguistica. (Techniques for the rehabilitation of problems of linguistic communication.) *Acta. audiol. foniat. Hispano-Amer.*, 2, 1961, 207-236.

The chaos in the language teaching procedures for deaf children of Spanish speaking countries is analyzed. The need for appropriate diffusion of adapted and experimented techniques in the field of hearing and speech rehabilitation is manifest. The active cooperation of the community and especially of the family in the rehabilitatory process is emphasized. Unprepared personnel are to be rejected. Anachronistic reading methods for hearing children must be revised since they affect the teaching of the deaf and of speech defectives. Speech handicaps must only be treated by personnel specialized in that one field. Different representative techniques in speech therapy are summarized, having been selected by preferred use as well as by the greatest success achieved by each one. The most convenient psychological attitude, providing the highest emotional content, is emphasized. Inductive techniques are established as the best in speech therapy. Different mechanical and electrical devices often in use in speech therapy were mentioned. Private institutions should receive government support, since rehabilitation is a community obligation. *(Authors' summary)*

1450. BUNGER, A. M., Speech reading —Jena method. Danville, Ill.: Interstate, 1961. Pp 245.

Other editions of this book appeared in 1932, 1944, and 1952. In a section prior to the preface of the present (1961) edition, the author discusses some of her corre-

spondence with a number of other persons concerning their experiences with the Jena method. Jena procedures are being used in developing the communication skills of deaf and hard-of-hearing children and adults; they are also being employed by speech correctionists in their work. The book incorporates the principles of the late Karl Brauckmann of Germany to the teaching of speechreading in English. On the title page it is referred to as "a textbook with lesson plans in full development for hard-of-hearing adults and discussion of adaptations for hard-of-hearing and deaf children." The bases of the Jena method—imitation, kinesthesis, and rhythm—are described at the outset, followed by presentation of a vowel order and a consonant chart. These vowels and consonants are combined to provide the core of a succession of lessons on syllables, word building from syllables, and word series in thought groups. Throughout, the student endeavors to develop skill in understanding as he practices (a) imitating the speech movements of the teacher as she talks, (b) feeling (kinesthetically) the speech movements as he talks in unison with the teacher and (c) taking advantage of the rhythm and stress cues of speech. Special procedures and lesson plans are presented for such topics as speechreading in life situations, conversation and informal talks, and rhythm in speech and life. Suggestions for a variety of supplementary materials are offered. A final chapter provides examples of Jena procedures as they are being used in actual classroom situations. There are several photographs of classes at work. 24 references. *(E.O.)*

1451. MANNEN, G., Enriching the language of the older deaf child—the parent's part. *Volta Rev.*, 63, 1961, 224-227.

This paper is an appeal to parents to join wholeheartedly in fulfilling their obligations to provide experiences within the home in order to enrich language growth. The author states that language, speech, and lipreading may all be defined as a means of communication and a means of expressing thought. She feels that parents should start where they are, in order to carry out this program rather than worry about devising a better procedure. She feels that the home offers opportunities for social language that are unparalleled by the classroom. The older children are becoming more socially aware and are becoming more inhibited than the younger children. She feels that the help given by parents can broaden their opportunities. The remainder of the article gives a number of suggestions to be used within the home for increasing vocabulary. An addendum to this article is a brief letter from a parent who reports her experiences in developing a larger vocabulary in her child. *(J.B.M.)*

1452. MASYUNIN, A. M., Rol' ostatkov slukha v rabote nad proiznosheniem zvukov rechi. (The role of residual hearing in the pronunciation of speech sounds.) *Spetsial'naya Shkola*, 95, 1960, 12-23.

One of the main tasks of Russian special schools is the formation of speech for deaf mutes through spoken and written forms. Pronunciation plays a great part, for the indistinctiveness of deaf speech prevents those around from understanding. The use of sound-amplifying equipment can assist in acoustic perception, can help lipreading potential and, above all, aid pronunciation. However, the history of surdopedagogy in Russia shows that the development of hearing for deaf mutes has been directed mainly to help lipreading and to hear the speech of others; far less often has hearing been used to form speech for the deaf. The vocal habits formed by deaf people through visual, tactile and vibratory sensations are often defective both in single sounds and complete words. It was found from investigation that deaf school children can often distinguish by ear some sounds which are not distinguished by them through pronunciation. It is expected, therefore, that special exercises on the acoustic differences between speech sounds should give definite results in correcting pronunciation. A work plan is given as elaborated for partially deaf children at the Institute of Defectology, Moscow. Results of an investigation at the Institute indicate that deaf children with considerable residual hearing suffer from many serious speech defects; there are possibilities in using acoustic methods to help pronunciation with partially deaf children and class lessons should be given with this in mind. *(H.G.W.)*

1453. O'NEILL, J. J. and OYER, H. J., Visual communication for the hard of hear-

ing: history, research and methods. New Jersey: Prentice Hall, 1961. Pp 163.

Lipreading is defined as "visual thought comprehension." It is a form of learned linguistic behavior. In lipreading instruction three specific areas to be considered are the speaker, the stimulus and the receiver or student. Lipreading instruction requires definite orientation and definite goals which can only be realized through a trained instructor. Historically, lipreading has its roots in the beginning efforts to educate the deaf in the 16th century. In America, however, the oral method of education, of which lipreading is an integral part, did not become firmly entrenched until the latter part of the 19th century. Since 1900 the names of Bruhn, Nitchie, Kinzie, etc. have become synonomous with the development of methods for teaching lipreading. Attempts to objectively evaluate lipreading ability were made as early as 1913. In general, two types of tests are employed; those using a face-to-face situation, and those using motion pictures. In recent years several tests have been developed using the latter medium. Although there has been research during the years concerned with the attributes of good lipreaders, nevertheless, as of the present time no strong relationships have been uncovered. The avenues for investigation are numerous in this field. Approximately two-thirds of the book is devoted to lipreading methods and materials for children and adults. There are numerous examples of case management with reference to the planning of lipreading lessons, etc. There is also a chapter dealing with television and lipreading instruction as currently programmed in several centers. *(C.P.G.)*

1454. SILVERMAN, S. R., Teaching speech. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 164-173.

The author approaches the teaching of speech with a physical description of what speech is, a physiological explanation of how the body mechanism produces sounds, a psychological discussion of the perception and motivation involved, and finally the problem of linguistics. The following suggestions for the actual teaching of speech are made: (a) an oral environment must be created; (b) spontaneity of speech should be encouraged, but only after proper formal instruction; (c) every sensory modality should be utilized; (d) the syllable should be the unit of speech used for teaching articulation; (e) a functional orthographic system is needed; (f) judicious correction of articulation is necessary, and (g) the social effectiveness of deaf speech must be evaluated. *(M.V.)*

1455. TATOUL, C. M., and DAVIDSON, G. D., Lipreading and letter prediction. *J. speech hearing Res.*, 4, 1961, 178-181.

This study [is] for the purpose of determining whether there is a relationship between lipreading ability, as measured by scores on a film test of lipreading, and synthetic ability, as measured by scores on a letter prediction test. Subjects were 50 male and female college students: 25 good lipreaders and 25 poor lipreaders as determined by film test scores. All subjects had normal hearing and vision. The results [provide] no evidence of a difference between good and poor lipreaders with respect to letter prediction ability or of any important relationship between lipreading ability and letter prediction ability. *(Authors' summary)*

1456. TERVOORT, B. Th., Language development in young deaf children. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 120-124.

The author outlines his longitudinal study on the language development of young deaf children which is now in progress. It involves, among other things, the filming of 10-minute units of communication between young deaf children, and the interpretation and analysis of this data linguistically. Some comments are made on the syntax of sign language and the difficulties involved in accurately studying its structure. *(M.V.)*

1457. TITOVA, M. F., O vzaimootnoshenii mezhdu strukturoi slova v ustnoi i daktil'noi forme. (On the correlation between the structure of a word in its spoken and written form.) *Spetsial'naya Shkola*, 98, 1960, 23-27.

At present in Russia it is maintained that the process of learning speech must be formed on the principle of the formation of

vocal intercourse. Fingerspelling is recognized as the most convenient form for this purpose. It creates special conditions towards the forming of deaf children's oral speech and it is maintained that the formation of the pronunciation of a word in the first year of study is closely connected with mastery over the structure of the word when fingerspelled. The textbooks available do not contain enough instructions about this work and do not adequately explain the mutual connection between oral and fingerspelled forms in the first stage of learning speech by a deaf child. The author outlines methods for developing speech and dactylic forms together so as to establish a firm system of conditioned reflex links, uniting mouth and finger movements. During the first half year of school work, the basic speech material is not mastered properly and fingerspelling plays a positive role in developing command over the phonetic structure of verbal material. Later a stock of speech material has been acquired, firmly mastered in fingerform and some part of it in both vocal and finger forms. At this stage, the first instances of pronunciation without fingerspelling appear, connected with the use of numbers up to 10 and the children's names. By the end of the first year instances of children giving up fingerspelling accompaniment for spontaneous vocalization are clearly increasing, particularly in games organized for them. *(H.G.W.)*

Multiple Handicaps

1458. RIGRODSKY, S., PRUNTY, F., and GLOVSKY, L., A study of the incidence, types and associated etiologies of hearing loss in an institutionalized mentally retarded population. *Train. Sch. Bull.*, 58, 1961, 30-44.

The population at The Training School at Vineland, New Jersey, was surveyed to determine incidence of hearing loss. Those with hearing losses were reported and discussed with reference to possible etiology of hearing loss, CA, etiological class of mental retardation, sex, and type of hearing loss. A review of studies related to incidence of hearing loss in the mentally retarded population is given. *(N.J.C.)*

1459. RUBELLA GROUP FOR DEAF/BLIND CHILDREN. Report on the conference on children with a combined visual and auditory handicap. Available from Mrs. P. Freeman, 63 Horn Lane, Woodford Green, Essex, Great Britain: 1961. Pp 83.

The conference used the term "deaf-blind" to include any degree of visual or auditory loss, regardless of cause, for which special education is needed. Papers delivered covered the etiology and incidence of congenital eye, ear, and heart defects, parent problems, psychological assessment, and education. Transcripts of the discussions following each paper and a summary of the conference proceedings are also given. *(J.D.S.)*

Psychological Factors

1460. ARDISSONE, M. B. de, La psychologie de l'enfant sourd et hypoacousique grave. The psychology of the deaf child and of the child with impaired hearing.) *Voix du Silence*, 4(1), 1960, 25-26.

The author starts by listing the research which has been made on spontaneous behavior, case history, behavior and response to psychological tests on the part of the deaf child and of the child with impaired hearing. The author further lists results obtained in their work by medical men, psychologists and educators and draws from all this material some practical and psychological conclusions. *(Author's summary)*

1461. CRUM, C., The normality of deaf children. *Volta Rev.*, 63, 1961, 231-232, 249.

This article is concerned with the similarity of problems of children who are deaf and those who have normal hearing. The author suggests that many of the teachers of the deaf forget the standards of normal behavior for hearing children and have set higher goals and higher standards for children who are deaf. The paper suggests the similarities in the learning of speech sounds, language development, as well as the emotional and social growth and development. It is pointed out that the child who is deaf seems to approach these things in the same manner, however at a much later time. *(J.B.M.)*

1462. DOHN, S., Psykologi og hörenedsættelse. (Psychology and hearing reduction.) *Nord. Tidskr. dövunderv.*, 2, 1961, 78-93.

A lecture held by the author for teachers of the deaf in Copenhagen, Denmark 1960. There is a link between psychology and hearing reduction. In order to help those with deafness and hearing reduction teachers ought to know a little of the psychology of deafness. Before bringing forth a linguistic explantion, there must come a psychological one. Under psychology of deafness we understand differential psychology (not to be mistaken for individual psychology, founded by Alfred Adler). The author avoids talking about "deafness" and prefers "hearing reduction." There is an open question: What is deafness? The answer will not be found only by audiometry or by means of acoustical methods of research. It must work together with a psychological valuation. In the child with a hearing reduction there are inner and outer surroundings which the teacher must influence in a normal direction. *(B.J.S.)*

1463. FRANCOCCI, G., Caractères et limites de la structure psychologique et intellectuelle du sourd-muet. (The character and limits of the psychological and intellectual structure of the deaf and dumb.) *Voix Silence*, 4(2), 1960, 16-17.

The apparent difference in psycho-intellectual development which exists between the deaf-mute and the normal subject is not due to insuperable difficulties of the mind, but to the deficiency or inefficiency of the school methods in use. Francocci infers the need for revising these methods on the basis of experiments now in progress. *(Courrier)*

1464. FURTH, H. G., Visual paired-associates task with deaf and hearing children. *J. speech hearing Res.*, 4, 1961, 172-177.

A nonverbal memory problem in the form of a visual paired-associates task was given to 180 deaf and 180 hearing children between the ages of 7 and 12 years. Norms of success on this task were established for each age group in both samples. No differences between the deaf and the hearing children were observed at ages 7 to 10. This result tended to support the theory that the basic capacity of visual memory in deaf children is equal to that of hearing children. At the 11- and 12-year level the hearing children showed a rapid improvement which was not matched by the deaf children. The deaf children's relative inferiority [is] thought to be due to a deficiency in experience and training, affecting their cognitive and motivational learning attitude. *(Author's summary)*

1465. HUGHES, R. B., Verbal conceptualization in deaf and hearing children. *Except. Child.*, 27, 1961, 517-522.

33 normal hearing children and 56 deaf children, all living in residential schools, ranging in age from 10 years to 14 years were used in this study; their mental ages ranged from 9-6 to 15-6 years. The primary purpose of the study was to compare the mental ability of the two groups in percept and concept behavior as reflected in the accuracy with which they relate known percepts to known concepts. Results showed that the hearing children performed significantly better than the deaf with respect to words of higher and lower orders of generality or levels of abstraction. The deaf as a group performed better at the percept level than the concept level. The orally and acoustically trained deaf performed better than the manually trained subjects. The implications for educational training are discussed. *(E.H.N.)*

1466. LEVINE, E. S., The psychology of deafness: Techniques and appraisal for rehabilitation. New York: Columbia U. Press, 1960. Pp 383.

The author provides in this book background data on deafness and the procedures involved in appraisal for rehabilitation. The data included are intended for teachers, administrators, parents, and vocational counselors. First the psychological, social and linguistic factors concomitant with varying degrees of hearing loss are discussed. Appraisal for rehabilitation is then treated in terms of the rehabilitation setting and the psychological examination and evaluation. Special problems of psychological practice with the physically disabled are outlined, the case history, diagnostic interview, psychological testing, how they should be done with deaf and hard-of-hearing adults and children. Specific intelligence and personality tests are discussed. A final section is devoted to the future in research and clinical needs. *(M.V.)*

1467. MINARIK, M., La vie intellectuelle d'un sourd-muet du point de vue psychologique. (The intellectual life of the deaf-mute from the psychological point of view.) *Voix du Silence*, 4(2), 1960, 22-23.

The author deals with the importance of hearing in the development of psycho-intellectual life. He further analyses the senses which can replace hearing, or can replace it in part. He further describes the state of handicap of the individual deprived of his hearing sense. He describes the ways and means to promote the deaf-mute's intellectual aptitudes. In his study, the author starts from the concept that the "intellectual level of the deaf-mutes depends from the education they have received." *(Author's summary)*

1468. MONASTERIO, I., Le niveau mental des sourds-muets. (The mental level of the deafmute.) *Voix du Silence*, 4(3), 1960, 10-17.

The author describes the factors which are at play in the formation of the psychological structure of the deafmute, meaning that the latter's organic anomaly is but seldom limited to deafness. The psychological limitation, even when [deafness] is the only anatomical anomaly, conditions the development of the individual to such a point that he cannot be compared to the adult individual who has been struck by deafness when no longer young. The author further classifies the various sorts of deafmutes and explains the different aspects of the psychological structure of the deafmutes and its determining influences. He further lists the tests which serve the purpose of determining the intellectual level of the deafmute. To conclude, he gives a list of the results obtained by means of the tests in question. *(Author's summary)*

1469. MURPHY, F. R., Is the use of standardized test forms fair to the deaf? In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 186-187.

The use of standardized test forms with the deaf without compensating for the language deficiency is discriminatory. To be fair the test must be designed with the deaf student's handicap in mind. Along with striving to improve our educational methods we should also upgrade our system of evaluating the results. *(M.V.)*

1470. NĚMEC, J., and ŠUPÁČEK, I., Rozbor hlavních psychologických faktorů ovlivňujících rehabilitaci náhle ohluchlých. (Analysis of the main psychological factors influencing the rehabilitation in sudden deafness.) *Cesko. Otolaringol.*, 10, 1961, 43-48.

In 10 adult patients who became totally deaf after the parenteral administration of neomycin, lipreading ability was assessed by a method evaluating (a) answers of the patient and his family to a set of anamnestic questions and (b) lipreading ability in an original test. The standard of speechreading was correlated with some selected psychological factors—social relations, age, time of gradual loss of hearing, results in Raven's intelligence test and Eysenck's questionary for neurotics, and data concerning the so-called auditive or visual type. The results were evaluated using Spearman's coefficient of serial correlation. The most important correlation was found with social relations and age of the patient. These results are used for directions to successful rehabilitation. In toxic-deafness due to neomycin an attempt to influence persistent tinnitus by the administration of vitamin B_{12} is advocated. *(Authors' summary)*

1471. STEPIEN, L., and SIERPINSKI, S., The effect of focal lesions of the brain upon auditory and visual recent memory in man. *J. Neurol. Neurosurg. Psychiat.*, 23, 1960, 334-340.

Auditory and visual recent memory was examined in 50 patients with unilateral focal lesions of the brain using a new test for recent memory proposed by Konorski (1959). Unilateral lesions situated in the temporal, parietal, or frontal lobe, quite independent of the side (dominant and subordinate hemisphere), cause no impairment of auditory or visual recent memory. An interesting case is presented in which a deficit for recent memory produced by a lesion in the right hippocampal zone giving afterdischarges in both temporal lobes cleared completely after the radical removal of an epileptogenic focus in the right fronto-temporal region. This is a confirmation of Penfield's theory that the hippocampal complex plays an important role in the normal processes of memory retention in man. *(Authors' summary)*

SOCIAL AND LEGAL FACTORS

1472. DICKSON, E. D. D., The effects of noise upon hearing. *J. Laryngol. Otol.*, 75, 1961, 485-486.

The intensity of traumatic agents is bound to make a greater impact on the ear. Emphasis in England, however, has been on the nuisance value of noise rather than effects on the organ of Corti. The otologist must have a vital role in the prevention of noise, conservation of hearing and compensation. The main objective of a hearing conservation program is preserving the ability to hear. After audiometric evaluation, hearing conservation protects those who demonstrate noise-induced hearing loss. A good ear protector is a safeguard for all but the most extreme noise exposures. A medical officer should be responsible for the selection and fit of safety devices. The plant foreman must be responsible for seeing that the protective devices are used. For successful utilization of these devices, both management and the worker must appreciate the value of ear protection. Industrial deafness will have to become a part of workmen's compensation sooner or later. Certain questions are presented for consideration. The proper deduction for presbycusis and nonindustrial causes must be made. *(J.G.A.)*

1473. FALBERG, R. M., The Wichita awakening. *Silent Worker*, 13(10), 1961, 3-4.

A delineation of the work of the Wichita Social Services for the Deaf, of which the author is executive secretary. Discusses the inception of this unique organization when it was realized that existing social service agencies were unable to communicate adequately with the deaf in order to fulfill their needs for social service. Financed by the Junior League of Wichita, with the cooperation and voluntary help of civic organizations from all of Greater Wichita. *(M.D.G.)*

1474. GILLIAT, M. E., An essay on projects. *Silent World*, 15, 1960, 115-117.

A number of needs and proposals are discussed including suggestions concerning national and local conferences to achieve greater unity, rehabilitation projects to meet the needs of people who have suddenly become deaf, educational services for those beyond regular school age, needs in higher education for the deaf, and projects concerned with film and mime. *(H.F.S.)*

1475. GLORIG, A., The effects of noise on hearing. *J. Laryngol. Otol.*, 75, 1961, 447-478.

The author presents a brief history of the noise problem from the first recognition, in about 1830, of its effects on man. The legal aspects of the noise problem, including workmen's compensation laws, is included. The nonauditory, as well as the auditory, effects of noise exposure are discussed. Nonauditory effects include (a) speech interference, (b) annoyance, (c) efficiency and (d) physiological changes. Auditory effects include temporary and permanent hearing loss. In dealing with the problem of noise exposure, a definition of normal hearing is presented. The rationale for the administration of hearing tests, including pre-employment audiometric tests in industry, is given. Also included is a hearing loss classification table and information pertaining to the industrial hearing test environment and the recording of data. Recent research of various noise exposed and nonexposed populations is presented. The problem of setting damage risk criteria for noise exposure is discussed, including a tentative hearing conservation limit. *(J.G.A.)*

1476. HENDERSON, S. C., and STEIN, S. P., Workshop for Catholic personnel for the deaf. *Amer. Ann. Deaf*, 106, 1961, 294-341.

This is a report of the Workshop for Catholic Personnel for the Deaf held at Gallaudet College on March 15-17, 1961. Areas covered were language, spiritual and social needs, organizations for the deaf, vocational rehabilitation, and marriage and family problems. *(C.P.G.)*

1477. KLINGHAMMER, H. D., Der Entwurf des allgemeinen Teils eines Strafgesetzbuchs aus der Sicht des Sachverständigen für Taubstumme. (An outline of the general part of a penal code, as seen from the standpoint of the expert witness for the deaf.) *Neue Bl. Taubs.*, 14, 1960, 120-126.

As a response to a request for cooperation in rewriting the penal code, the au-

thor states that several paragraphs in the old code are considered to have applicability to the deaf. In the new draft, deafness as such should not be a ground for excuse (to prevent the old prejudice of deafness being some kind of feeble mindedness or irresponsibility per se) unless it is combined with mental deficiency. There should be no special consideration for deafness on the same ground as is given for psychopathological cases. But deafness can in some cases (e.g., ignorance of the law) be one of the excusing circumstances. The expert witness should be a professional worker with the deaf. It is also desirable to make an attempt to found a special institution where deaf offenders have the opportunity for re-education to which they are legally entitled. *(B.Th.T.)*

1478. MAGAROTTO, C., The problems of the deaf and the activity of the W.F.D. *Voix du Silence*, 4(1), 1960, 2.

Discusses the problems of deafness in relation to classification, diagnosis, education, and vocational rehabilitation. The organization and activities of the World Federation of the Deaf are presented briefly. *(J.D.S.)*

1479. RUBIN, N., Auto insurance for the deaf. *J. Rehab.*, 27(3), 1961, 20.

The Stuyvesant Insurance Company, in cooperation with the Insurance Guidance Service of Pennsylvania, is now offering automobile insurance at standard rates to deaf persons in all states east of the Mississippi, except in states having compulsory insurance laws. Only automobiles owned by deaf persons are included in this particular program so that accurate statistics on driving habits of the deaf may be accumulated. . . . The author is the son of deaf-mute parents, is vice-president of the Insurance Guidance Service of Pennsylvania, a member of the Pennsylvania Society for the Advancement of the Deaf, and active in many insurance and charitable groups. *(Rehab. Lit.)*

1480. STEWART, D., Some occupational effects of noise. *J. Laryngol. Otol.*, 75, 1961, 479-484.

The author reports that, with few exceptions, little significant research has been carried out in British industry concerning the occupational effects of noise on health and human performance. The problem of noise can be considered from (a) the effect on hearing and health, (b) the effect on human performance, (c) hearing conservation programs, and (d) methods of reducing noise. At the present time, little is known about the effects of noise on the health and efficiency of those in industry. The author cites a study which indicated that 190 out of 219 cases had hearing loss due to noise. Noise measurements suggest that only when the overall noise level exceeds 105-108 phons is serious damage likely to be caused to hearing. At this level, the ear must be protected by some suitable ear defender. The author reports his personal experiences with boilermakers and drop-forge stampers. With few exceptions, they were aware that deafness occurred in their industry, but it was accepted as part of the job. The number of their complaints was small. The effects on human performance are discussed and it seems probable that the effect of noise on worker output might be significant. A noise abatement bill recevied its second reading in the House of Commons on March 4, 1960. It is indicative of public reaction concerning the whole problem of noise. A question for the government is whether or not occupational deafness should be classified as industrial disease. Another problem is medical supervision of a hearing conservation program. *(J.G.A.)*

1481. WRIGHT, R. D., Is Silence Golden? *Rehab. Rec.*, 2(2), 1961, 3-5.

This article is based on a speech delivered at the dedication of the Speech and Hearing Rehabilitation Center at the University of Wisconsin. The author calls attention to the shortage of certified personnel in speech and hearing, to geriatric hearing problems and to aspects of prevention. Special emphasis is placed on the difficulties in communication resulting from hearing impairment. Finally, a plea is made for a better understanding of such persons on the part of professional workers as well as the general public. *(D.R.F.)*

Vocational Adjustment

1482. DOBSON, C. C., Offset printing —a new challenge. In *Proc. 39th Meet.*

Conv. Amer. Instr. Deaf. Washington, D. C.: USGPO, No. 62, 1960. Pp 156-158.

There is a huge increase in the use of offset machinery in the printing industry. For example, employees in offset work increased 55% relative to a rise of only 6% for those in the letterpress field in the period from 1947 to 1956. 85% of commercial shops have introduced offset to supplement letterpress. The author feels if schools are to meet these facts they must teach operation of phototypesetting machines, darkroom techniques, pastcup makeups, and offset presswork. Current training programs for offset work are discussed briefly. *(M.V.)*

1483. LANG, G. M., Broader vocational programs for girls. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 158-159.

The following vocations are felt to have promise for girls and might well be considered for state schools: (a) cake decoration and finishing, (b) upholstery, slipcover, and drapery making, (c) typing and business techniques, (d) reweaving (French weaving), (e) laundry and dry cleaning work, (f) arts and crafts. *(M.V.)*

1484. LOCKHEED MISSILES AND SPACE DIVISION, Lockheed plant has sign language classes. *Silent Worker,* 13(10), 1961, 9.

The sign language of the deaf is being taught to both the deaf and normally hearing supervisory employees at Lockheed Missiles and Space Division, with two aims: (a) to teach new and specialized terms of missile making to the deaf so they can take the same courses in manufacturing skills offered to other workers and (b) to teach the rudiments of the sign language to those hearing employees in supervisory capacities who have to communicate with the deaf. *(M.D.G.)*

1485. WILLIAMS, B. R., How vocational education today can best serve the deaf. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 152-155.

The author points out that today's demand for unskilled workers is rapidly declining. Traits such as speed, alertness, mechanical skills, mathematical knowledge, and science training are important to the worker going into the present labor market. It is the responsibility of schools not to provide terminal trades for students, but to give them work habits and basic knowledge and skills. *(M.V.)*

1486. WILLIAMS, B. R., Guidelines for the establishment of rehabilitation facilities for the deaf. *Amer. Ann. Deaf,* 106, 1961, 341-364.

This report summarizes the Conference on Rehabilitation which was held at Fort Monroe, Va., from Oct. 12-15, 1959. The report is outlined in six chapters and covers such areas as the needs, programs, physical plants, services, personnel, relationships with other agencies, and finances associated with the rehabilitation of the deaf. *(C.P.G.)*

SPEECH

Acoustics

1487. HEINZ, J. M., and STEVENS, K. N., On the properties of voiceless fricative consonants. *J. acoust. Soc. Amer.,* 33, 1961, 589-596.

In this paper an acoustical theory of the production of voiceless fricative consonants is reviewed, and it is shown that the results of analyses of spectra of these consonants are consistent with the theory. Simplified versions of fricative consonants, generated in accordance with the theory, are demonstrated to elicit responses that are in agreement with the results of the spectral analyses. Although the data presented here are not of sufficient scope to be considered as general descriptions of fricative consonants as they occur in all phonetic contexts and as they are produced by many different talkers, they nevertheless suggest a method of approach for further study of these and other classes of speech sounds. *(Authors' summary)*

1488. LIBERMAN, A. M., HARRIS, K. S., KINNEY, J. A., and LANE, H., The discrimination of relative onset-time of the components of certain speech and nonspeech patterns. *J. exper. Psychol.,* 61, 1961, 379-388.

An experimental investigation of the relation between phoneme labeling and discrimination in the case of an acoustic and linguistic distinction. The authors also attempt to throw light on the origins of

the discrimination function by questioning whether this function is innate or acquired and, if acquired, to ascertain whether it is a case of acquired distinctiveness near phoneme boundaries or acquired similarity within the phoneme category. The phonemes used were synthetic approximations of *to* and *do*. Apparatus used was the Pattern Playback. The investigation yielded results demonstrating that discrimination was better across a phoneme boundary. This and other factors led the investigators to conclude that the sharpening at the phoneme boundary is an effect of learning and represents a considerable amount of acquired distinctiveness. *(J.G.S.)*

1489. LIEBERMAN, P., Perturbations in vocal pitch. *J. acoust. Soc. Amer.*, 33, 1961, 597-603.

Pitch fluctuations as a function of "emotional" modes of reading were studied. Analysis of 7000 pitch periods was performed by an IBM 709 computer. An example of the type of information obtained by this method is the fact that the magnitude of the difference between the durations of adjacent pitch periods was greater than 0.6 msec 20% of the time. *(B.A.L.)*

1490. MATHEWS, M. V., An acoustic compiler for music and psychological stimuli. *Bell Syst. tech. J.*, 40, 1961, 677-694.

A program for synthesizing music and psychological stimuli on a digital computer is described. The sound is produced by three operations: (a) A compiler generates the programs for a set of instruments. (b) These instruments are "played" by a sequencing program at the command of a sequence of "note" cards which contain information analogous to that given by conventional music notes. (c) The computer output, in the form of numbers on a digital magnetic tape, is converted to audible sound by a digital-to-analog converter, a desampling filter, an a loudspeaker. By virtue of the general nature of the compiling program a great variety of instruments may be produced, and the instrument programs are quite efficient in terms of computer time. The "note" cards are arranged to minimize the effort necessary to specify a composition. Preliminary compositions indicate that exceedingly interesting music and useful psychological stimuli can be generated. *(Author's summary)*

1491. MATHEWS, M. V., MILLER, J. E., and DAVID, E. E., Jr., Pitch synchronous analysis of voiced sounds. *J. acoust. Soc. Amer.*, 33, 1961, 179-186.

A study of vowel sounds by means of a spectral analysis keyed syncronously to the voice pitch has been carried out. Spectra are obtained by Fourier analysis of individual pitch periods which were established by visual inspection of oscillograms. A digital computer served as the analyzer. The spectra are represented by a pattern of zeros and poles obtained by a process of successive approximation, again carried out by computer. The contributions from vocal tract and glottal source can be uniquely separated and examined. These results show that vowel sounds can be represented by a sequence of poles arising from the vocal tract and a sequence of zeros characterizing the izglottal excitation. The frequencies of the vocal tract poles agreed with previous measurements, but the damping factors were not entirely consistent with earlier estimates. The zeros showed approximately uniform frequency spacing, particularly at high frequencies. A theoretical development indicated that this characteristic was to be expected from the known structure of the glottal excitation. The zero pattern was used to estimate the ratio of open-to-closed time for the glottis during voicing. *(Authors' summary)*

1492. OSTWALD, P. F., Humming, sound and symbol. *J. aud. Res.*, 1, 1961, 224-232.

Humming is a sound produced by singing with the mouth closed. It may be used to express pleasurable emotions related to mother-love and satiation. Humming can also be involved in aggressive and masturbatory behavior. As a masking noise, humming helps certain people to withdraw from external stimuli during states of revery, intellectual work, and obsessional preoccupation. In verbal discourse, humming occurs as the word *hm*, which may signify assent, negation and other possible meanings. The phoneme /m/ may provide words in which it appears with an emotional flavor that recalls the primal mother-child relationship from which humming

sounds originate. [25 references] *(Author's summary)*

1493. SIVERTSEN, E., Segment inventories for speech synthesis. *Lang. Speech*, 4, 1961, 27-89.

Speech synthesis may be based on a segmentation of the speech continuum either into simultaneous components or into successive time segments. The time segments may be of varying size and type: phonemes, phoneme dyads, syllable nuclei and margins, half-syllables, syllables, syllable dyads, and words. In order to obtain an estimate of the size of the segment inventory for each type of segment, a phonological study was made of the particular phoneme sequences which occur in English, particularly in relation to the immediate constituents of the syllable (nucleus and margin) and to the syllable. An estimate was also made of the number of prosodic conditions required for each type of phoneme sequence. It was found that in general there is a direct relationship between the length of the segment and the size of the inventory. However, when the borders of the proposed segments do not coincide with the borders of linguistic units, the inventory has to be relatively large. The value of using the various types of segment for speech synthesis is discussed, both for basic research on speech and for practical application to a communication system with high intelligibility. [Appendix contains (a) all the word-initial and word-final margins (M) which have been documented for the GA and RP dialects of English, (b) the particular syllable nuclei (N) with which each margin may combine, and (c) key-words for these MN and NM combinations.] *(Author's summary)*

1494. WELCH, P. D., and WIMPRESS, R. S., Two multivariate statistical computer programs and their application to the vowel recognition problem. *J. acoust. Soc. Amer.*, 33, 1961, 426-434.

This paper describes two IBM 704 EDPM programs which were written to aid in the development of mechanical speech recognition devices. Both are based upon multivariate statistical techniques. It further describes the application of the two programs to the problem of vowel recognition using fundamental frequency and formant information. *(Authors' summary)*

ANATOMY AND PHYSIOLOGY

1495. BALDAN, G., Ricerche sulla motilità del palato mediante l'elettromanometria. (Electromanometric research of the motility of the palate.) *Bol. Soc. Ital Fonet. Foniat. Audiol.*, 10(1), 1960, 110-141.

After a short historical introduction, the author describes the Sanborn electric manometer which registers small differences of air pressure electromagnetically. The variations of air pressure are generated in a little balloon placed in the rhinopharynx and, consequently, are due to pressure of the soft palate. In another series the air pressure in the (experimentally closed) vestibulum of the nose is registered by a fine polyethylene tube. The results illustrate some previously known facts. The author recognizes the possibility of mechanical interference with the finer movements of the palate. 47 references.

The same author (with C. Dalla Rosa, pages 153-174) demonstrates with this method the velopharyngeal part of swallowing and, in another article (pages 182-206), some cases of various pathological types of motility of the palate. *(D.A.W.)*

1496. KEENE, M. F. L., Muscle spindles in human laryngeal muscles. *J. Anat.*, 95, 1961, 25-28.

This study is concerned with determining the presence or absence of neuromuscular spindles in the human laryngeal muscles, the cricothyroid and the cricoarytenoideus posterior muscles. One of each pair was cut longitudinally, the other transversely to the fibers. It was observed that neuromuscular spindles are present in all the laryngeal muscles of man in considerable numbers and also that these spindles exhibit the basic pattern described by Sherrington in 1894. The question as to the significance of the sizes of muscular nerve fibers and of the size-frequency distribution of the fibers is discussed. *(M.N.)*

1497. SANGVICHIEN, S., Palatopharyngeus muscle and the elevation of the epiglottis after swallowing. *Anat. Rec.*, 136 1960, 271.

By the use of cine-radiography for the study of the mechanism of deglutition, it

is agreed that the epiglottis moves down to protect the laryngeal inlet. Literature fails to give what causes it to move to its normal position. Microscopic examination does not convince me that the epiglottis can depend on the recoil of the elastic cartilage. Rapid movement of such mechanism (1/30 sec., Saunders, '51) can be done only by the action of muscle. The whole upper part of the digestive and respiratory passages together with the tongue and soft palate were removed en bloc, mounted in anatomical position with the tongue arched tightly forward. The soft palate and the uvula were bisected and tied apart above the specimen, making the palatopharyngeal fold on stretch. Dissection shows that the palatopharyngeus muscle has, besides the insertion on the posterior border of the thyroid cartilage, also some fibers attached to the lateral margin of the lingual surface of the epiglottis, at a point about 16 mm from the apex. This muscle should by its attachment to the epiglottis raise it to its normal position. There are variations in some specimens, the muscle fibers do not come close to the lateral margin but are replaced by fibrous tissue. *(Author's summary)*

1498. WOOD, P. J., Histodifferentiation in the palate of the human embryo. *Anat. Rec.*, 138, 1960, 391.

A study of normal growth and differentiation of the human palate [was] undertaken. The critical period for palate formation in the human lies between 8 and 10 weeks of the gestation period. During this interval the shelves elevate and fuse, and ossification in the palative processes, already perceptible at eight weeks, intensifies. *(Author's summary)*

Auditory Feedback

1499. CHASE, R. A., SUTTON, S., and RAPIN, I., Sensory feedback influences on motor performance. *J. aud. Res.*, 1, 1961, 212-222.

[This article is] concerned [with] the role of sensory feedback in the control of voluntary movement. Delays in auditory feedback were found to produce similar changes in speech and keytapping motor performances. These changes consisted of increases in amplitude, decreases in rate of performance, and a tendency to make repetitive errors. Similar changes were produced in keytapping by delaying different sensory events: a click, a light flash, and a tactile pulse. These findings suggest that delayed sensory feedback produces qualitatively similar changes in motor performance even when there is great variation in the motor performance under study, and in the sensory event being delayed. The potential diagnostic significance of sensory feedback research in the clinical evaluation of feedback monitoring systems as well as potential therapeutic applications [are] discussed. *(Authors' summary)*

1500. KODMAN, F., Jr., Controlled reading rate under delayed speech feedback. *J. aud. Res.*, 1, 1961, 186-193.

Twenty white young adult males were instructed to read a test passage at various reading rates under optimum conditions of delayed speech feedback. The subjects were carefully screened for speech, hearing and voice defects and the presence of a strong regional dialect. They were equated for degree of speech disturbance and reading rate under delay. They were instructed to read at 132, 96, 72 and 60 words per minute in order to reach an error free reading. As reading rate decreased, error words decreased until the articulatory errors reached zero. The mean maximum error free reading rate was 84 words per minute. Analogies were made to the speaking system operating as a servosystem. It [is] hypothesized that the corrective changes exerted by the control system, if it exists, are more rapid for slower reading rates than for faster reading rates. *(Author's summary)*

1501. STAATS, A. W., Verbal habit-families, concepts, and the operant conditioning of word classes. *Psychol. Rev.*, 68, 1961, 190-204.

This paper discusses and describes the application of the Hullian construct of habit-family to language. The concept of word meaning is treated as a conditioned response, an implicit mediating response. Operant conditioning accounts for the learning of verbal responses, and meaning response, which is considered as conditionable sensory response, is the anticipatory conditionable sensory response. The concept is seen as a verbal habit-family formed

usually on the basis of a class of stimulus objects having identical elements. The model of verbal habit families was concept development and function. The relationships between language processes and environmental processes were discussed in terms of concept formation. *(J.G.S.)*

COMMUNICATION THEORY

1502. BALL, G., Speaking without words. *Amer. J. Nurs.*, 60, 1960, 692-693.

Conscious and unconscious communication takes place on a nonverbal level between hospital personnel and patients, especially those who are mentally ill. Psychiatric nurses must use intuition, knowledge and experience to develop sensitivity to such communication. Nonverbal clues during verbal conversations are included in this article, but distortions due to organic pathology or drug therapy are not described. The patient's awareness of nonverbal signs is mentioned. *(L.E.C.)*

1503. BERLOW, D. K., From language to communication. New York: Holt, Rinehart, and Winston, 1960. Pp 318.

This text on language and communication deals with the elusive and global process of human communication using the theories, concepts, and data of psychology, linguistics, and the social sciences. The text is addressed primarily to lawyers, teachers, advertisers, journalists, labor, industry and government spokesmen, and adult education for whom the process of communication has interest and meaning as a dynamic and vital function of everyday life. The author states that he also hopes the text will be of interest and value to college students about to begin the systematic study of communication process and practice. Berlow begins with the model of the communication process and elaborates upon its components. He then reviews language learning as intra-individual communication and interaction as interpersonal communication. He explores social and cultural factors as further complicating the communication process. He goes on to problems of meaning in which he utilizes distinctions derived from rhetoric and logic, as well as more modern concepts derived from Ogden and Richards, Morris, Korzybski, and Osgood. There is a very brief discussion of the origin of language. The author borrows terminology and concepts from (tele-) communications theory, learning theory, social system theory, reference-group theory, semantic-differential analysis, and classical rhetoric. The reader learns that the process of intrapersonal communication is equivalent to the process of human learning, that the process of learning language is the same as the process of learning anything, and that meanings are the receiver-and-source behaviors that we perform internally. *(P. W.N.)*

1504. KING, W. H., Immediate and delayed recall of information presented orally and visually. *Educ. Rev.*, 11, 1959, 125-129.

The study was designed "to compare the results obtained by children on different types of comprehension passages when these were presented (a) orally–as listening material, and (b) visually–as reading material. . . . 175 boys and girls in the last term of their junior schools read the first test and then answered a set of questions on the contents. Exactly a week later the same children were given the same set of questions which they answered from memory. These children were given the second passage orally, answered the questions and a week later answered the same set of questions from memory. 221 boys and girls also took the same tests in the reverse order. . . . Considering the sample of boys and girls, there seems to be some evidence that for immediate recall listening is more effective than reading; but the effects at the end of a week are not significantly different. However the brightest boys and, to a lesser extent, the brightest girls recall facts better when the material is read by them . . . the less academically inclined children tend to absorb initially more facts if these are presented orally." *(Child Develmpt Abst. Bibl.)*

1505. LEVIN, H., BALDWIN, A. L., GALLWEY, M., and PAIVIO, A., Audience stress, personality, and speech. *J. abnorm. soc. Psychol.*, 61, 1960, 469-473.

This study was designed to test the effects of a situational factor–the presence or absence of an audience–and two personality variables–exhibitionism and self-consciousness–on the length of speech and on the number of errors in speaking. 48 children, aged 10 to 12 years, told two

stories to the experimenter alone and two to an audience of six adults. The story beginnings were given to the subjects. The findings were: (a) Almost every subject told a longer story in the private compared to the audience situation, (b) highly exhibitionistic children were least influenced in this respect whereas self-conscious children reduced the length of their stories drastically before the six observers, (c) children who were both highly exhibitionistic and self-conscious made the most speech errors, (d) this finding was magnified under the audience condition. *(Authors' summary)*

1506. POTTER, S., Language in the modern world. Baltimore: Penguin Books, 1960. Pp 221.

A popular introduction to general linguistics. The author defines language as both an arbitrary system of speech-sounds utilized for communication and as a series of sounds produced by the articulating organs of the speaker, received by the listener and implying complex adjustments by nervous systems. A linguist is defined as one concerned with the objective analysis of the structure of sounds, words and sentences in all languages. Short chapters include descriptions of major language groups throughout the world, the making of words, sounds and symbols, the practical study of languages and comparative linguistics, among others. Potter stresses the point that everyone should learn at least another language to widen understanding of his native tongue and to broaden the basis of cultural and social communication. He believes that by providing a clear and modern picture of the complexity and variety of the English language, the new spirit of linguistic enterprise will be aided to improve means of communication. *(L.E.C.)*

1507. RUBENSTEIN, H., and ABORN, M., Psycholinguistics. In P. R. Farnsworth and Q. McNemar (Eds.), *Annual Review of Psychology*. Palo Alto, Calif.: Annual Reviews, 1960. Pp 291-322.

A critical review of the literature from 1954 through 1958. The analysis uses the following divisions of subject matter: probability of language segments, word association, recognition of speech sounds, labelling, measures of meaning, the Whorfian hypothesis, universal phonetic symbolism, language learning, language disturbances, language statistics, and books. 155 references. *(J.D.S.)*

1508. ZAJONC, R. B., The process of cognitive tuning in communication. *J. abnorm. soc. Psychol.*, 61, 1960, 159-167.

The cognitive effects of the person's role in the communication process were examined in two experiments. A systematic method for the description of cognitive structures was developed, and in the first experiment persons expecting to transmit information were compared with others expecting to receive information for the extent of differentiation, complexity, unity, and organization. The results show that transmitters activate cognitive structures which are more differentiated, complex, unified, and organized than those activated by receivers. The second experiment involved the anticipation of dealing with incongruent information, and in comparison with groups dealing with congruent information, those expecting to deal with incongruent information generally showed decreased differences between transmitters and receivers. These results were accounted for by an increase in the proportion of specific cognitive components and in the tendency to reject material inconsistent with the person's own opinion. *(Author's summary)*

Intelligibility

1509. BLACK, J. W., Speech intelligibility: A summary of recent research. *J. Commun.*, 11, 1961, 87-94.

Intelligibility is being tied down. . . . This basic progress is of more consequence than are the recent applications to audiometry . . . and to critera used in research studies. In particular, the relative intelligibility of a word can be estimated, and a number of facts are known about the errors that listeners make in identifying the words of their language. Ahead lies the all-important prediction–the use of the individual's voice as the basis for estimating his relative intelligibility. *(Author's summary)*

1510. KLUMPP, R. G., and WEBSTER, J. C., Intelligibility of time-compressed speech. *J. acoust. Soc. Amer.*, 33, 1961, 265-267.

The authors show that simple speech utterances may be compressed in time by merely speeding up the playback of a tape recorder. A compression of 0.67 produces no serious losses in intelligibility. PB words lose only 10% in intelligibility when compressed 0.75. *(B.A.L.)*

1511. OWENS, E., Intelligibility of words varying in familiarity. *J. speech hearing Res.*, 4, 1961, 113-129.

In studying the relationship between word familiarity and intelligibility, seven monosyllabic word lists were divided into groups of three, two, and two, the lists of each group being matched phonetically and varied systematically with respect to familiarity. . . . After [having been] recorded under seven conditions of distortion achieved by low-pass filtering, the seven lists were presented auditorily to listener groups. . . . 210 . . . listeners were divided into seven groups of 30, each group listening to all seven lists under a single condition of distortion. Test words were presented only once, with no previous practice permitted. Lists characterized by greater familiarity, even to a slight degree, were . . . more intelligible. Findings [are] related to PB-50 and W-22 intelligibility lists, implications for refinement of test lists are considered, and results are tenuously generalized to persons with impaired hearing. *(Author's summary)*

1512. THOMPSON, P. O., WEBSTER, J. C., and GALES, R. S., Liveness effects on the intelligibility of noise-masked speech. *J. acoust. Soc. Amer.*, 33, 1961, 604-605.

Liveness is a quality of sound correlated with room volume, reverberation time, and distance between the sound source and listener (or pick-up device). In this study, speech samples of varied liveness were obtained by mixing, in controlled ratios, the direct output of the talker's microphone and an output passed through a 9x7.5x6 ft reveberation chamber. In preliminary laboratory tests, the materials consisted of PB words, short phrases, and connected discourse; and varied from very low to high liveness values. The main tests were of an applied nature. Lists of sentences of low and zero (dead) liveness were transmitted over VHF radio and presented over earphones to 19 listeners in a series of intelligibility and preference tests. These lists were also presented to listeners in 105 db SPL helicopter cabin noise. The results indicated that the live speech was less intelligible and less preferred. *(Authors' summary)*

1513. WANG, W. S-Y., and FILLMORE, C. J., Intrinsic cues and consonant perception. *J. speech hearing Res.*, 4, 1961, 130-136.

The purpose [of this study is] to investigate the contribution of some intrinsic cues in consonant perception. Subjects were 10 phonetically-trained listeners. Test items were 405 consonant-vowel-consonant syllables consisting of nine consonants and five vowels in all combinations. Results of correct identification of initial consonants suggests that vowel amplitude, degree of formant bend, and vowel nasalization are significant parameters in the vowel for identifying the consonant which precedes it. *(Authors' summary)*

PHONETICS

1514. BOSMA, J., and SMITH, C., Infant cry: a preliminary study. *Logos*, 4, 1961, 10-18.

Radiographic studies of pain-elicited cry among 5 normal-term. infants observed between one day and two weeks of age and five normal infants four to six months of age were made. It is observed that there is "a characteristic pattern of maturation of response. The generalized arousal of the newborn infant, in which the cry itself is only a part of the total body response, becomes a more discrete and specific phonatory effort by the older infant. Variation in the nature of the cry and in the associated body movements becomes characteristic." Descriptions of the equipment and radiographic techniques are given. Photographs of radiographic and cinefluorographic are included. *(H.L.L.)*

1515. DARLINGTON, C. D., Speech, language and heredity. *Speech Pathol. Ther.*, 4(1), 1961, 3-6.

"The languages spoken by mankind use many different complements of sound with particular phonemes and combinations of phoneme characteristic of each language. Some languages are rich; others are poor. All differ. Differences occur between lan-

guages and even dialects of common origin." The differences are explained genetically in terms of the structure of the articulatory apparatus which leads the various communities to shape their speech in terms of average preferences in articulation. Members of the community who deviate markedly in the anatomy of their speech apparatus will provide problems for the speech therapist. Suggestions for further research are given. *(J.D.S.)*

1516. DEME, L., Disputed aspects of phonetics. *Acta linguist.*, 11, 1961, 99-156.

The paper presents first the author's theoretical views about phonetic phenomena and then discusses several disputed aspects of phonetics. Speech sounds are considered both as independent units and as members of a sound system within a particular language. In separate chapters, the author treats the organs of speech and their function, general properties of sounds and sound groups, individual properties of sounds, classification of speech sounds, representation of speech sounds, the problems of diphthongs and affricates, and nasalization phenomena. Most of the examples are taken from dialects of Hungarian, but parallels are drawn with comparable phenomena in other languages. Speech sounds are classified according to their physiological formation, which the author considers to be a more solid basis for classification than the acoustic principle. Two pairs of articulating organs are distinguished in the oral cavity: the tongue and palate, and the two lips. Consonants are characterized by the function of one pair of the speech organs; simultaneous function of both pairs forms a characteristic property of the vowels. According to the shape of the oral cavity, the sounds can also be called aperture sounds and no-aperture sounds. The common feature of the aperture sounds is the opening in the oral cavity and between the lips: the sounds have two characteristic features, and the oral cavity only modifies the basic sound produced by the vocal cords. The common feature of the no-aperture sounds is the acute obstruction in the oral cavity: these sounds are characterized by a single pair of oral speech organs, the function of which determines the given sound whereas the voice produced by the vocal cords only acts as a modifier or may even be absent. A tabular classificatory scheme for the consonants is presented. [r] is arranged among the stops because of the recurring explosive stop, and [l] with the spirants, because according to the author the distinctive characteristic of the spirants is a gap between the articulatory organs, and the production of [l] involves a lateral gap. Several vowel diagrams are given in which the vowels are arranged on a triangle opening upward. The direction and the height of the tongue elevation provide the basic criteria for classification. Auxiliary lines are drawn along the two sides to allow for the representation of labials and of the fricative consonants produced by narrowing the wide gap at the point of articulation until friction is produced. These sounds are called border sounds. The author defines a diphthong as a long vowel that differs from a monophthongal long vowel by either starting or ending in a border position. The border sounds comprise [β] for the labial border position, [j] and [ɣ] for the lingual border position, and [ʌ] for the lower border position. Opening diphthongs start from the labial or lingual border position, closing diphthongs tend toward the labial or lingual border position. Descending stress is assumed to be original for opening diphthongs and ascending stress for closing diphthongs. Stress transfer in originally opening diphthongs to the first component results in dipthongs ending in the sound [ʌ]. Stress distribution shows whether the diphthong starts from, or tends toward, the border position; the distribution of duration indicates to what extent the start from, or the tendency toward, the border position is consonantal. The author states that stress and duration in Hungarian diphthongs are independent of one another: any fully stressed member or any weakly stressed member may have any degree of duration from very short to long. The total duration of diphthongs in Hungarian is, in general, not materially longer than that of long vowels, since the diphthong has the phonological value of a single long vowel. Various sound changes in Hungarian dialects and their possible phonetic causes are discussed. Extensive references to European phonetic literature are provided. *(I.L.)*

1517. FOURQUET, J. VON, Der Vokalismus nichthaupttoniger Silben im deutschen Fremdwort. (The vocalism of syllables not bearing the main stress in German words of foreign origin.) *Phonetica*, 6, 1961, 65-77.

The normative works of Siebs, de Boor-Diels, and Viëtor differ as to the phonetic and phonological values of the vowel signs a, e, i, o, u, ä, ö, ü in unaccented syllables of words of Greek and Latin origin (e.g., Pädagogik, Ästhetik). Siebs presumes short, closed vowels in open syllables with the... exception of *ä*, which he specifies as a long vowel, Viëtor half-long vowels. Siebs makes a difference of timbre between open *e* and *ä*, between front *a* and back *a*, de Boor-Diels and Viëtor do not make this difference at all. These uncertainities can partly be explained by confusions of quantity and timbre, of literal and phonetic syllables. The author tries to define the problems phonetically and phonologically more exactly. He finally demands to investigate the use in an objective, i.e. experimental way, so that a new and more consequent fixation of the norm will be possible. *(Author's summary)*

1518. GOLDMAN-EISLER, F., A comparative study of two hesitation phenomena. *Lang. Speech*, 4, 1961, 18-26.

The durations of hesitation devices such as the sounds /ɑ, ɛ, æ, r, ə, m/, also called *filled pauses*, were measured and compared with the durations of silent hesitations or *unfilled pauses*. Their individual consistency and psychological significance were also investigated and the relation to uncertainty of filled pauses and unfilled pauses respectively was compared. It appears that under certain conditions of speech production the two hesitation phenomena reflect different internal processes. *(Author's summary)*

1519. KNETSCHKE, E. VON, Fragebogen und Tonband. Zur Frage der Vergleichbarkeit deutschmundartlicher Sprachaufnahmen. (Questionnaire and tape-record. The comparability of recorded German dialects.) *Phonetica*, 6, 1961, 82-96.

Lexicography, dialect geography, and phonometry are regarded as topical methods of German dialectology operating jointly side by side rather than as different stages of historical development. A list containing all features relevant in all tape-records of the Deutsches Spracharchiv such as the speaker's age and social origin, the peculiar, viz. monological, manner of talking, the situation of recording, a low variability of speed, pitch, and accent is discussed with regard to the mutual comparability of the records. Possibilities of immediate comparison are mentioned, and subsequently a new attempt is made to integrate the phonometrical isophones of quantity into the general results of dialectology by newly interpreting the quotient patterns in the Franconian of the Rhine and in western Alemannic, unexplained to dialectology as yet. Finally, relations are adumbrated between the results phonometry will obtain from the tapes of the Deutsches Spracharchiv in the future and the hitherto existing results of dialectology. *(Author's summary)*

1520. LAFON, J. C., Recent aspects de la physiologie de la phonation. (Recent aspects of the physiology of phonation.) *Bol. Soc. Ital. Fonet. Foniat. Audiol.*, 10(1), 1960, 1-26.

This demonstration of new facts and approaches is mainly directed against the neuro-chronaxic theory of Husson, but also warns that the fact that such a theory could appear at all shows that the old theory failed to explain many physiological facts. Speaking of the analysis of the resonance phenomena in the larynx, the author emphasizes that the Fourier analysis is only a mathematical analogy, not the exact representation of physical facts. Some examples from a (relatively) new apparatus of registration, the Sonograph, are given. *(D.A.W.)*

1521. LEHISTE, I., and PETERSON, G. E., Transitions, glides, and diphthongs. *J. acoust. Soc. Amer.*, 33, 1961, 268-277.

Within the limits of the present investigation, it appears that spoken American English contains syllabic sounds which can be described in terms of fifteen syllabic nuclei, short and long. Phonetic definitions are therefore suggested for transitions, glides, and diphthongs. *(B.A.L.)*

1522. LEHISTE, I., and PETERSON, G. E., Some basic considerations in the analysis of intonation. *J. acoust. Soc. Amer.*, 33, 1961, 419-425.

This paper considers some basic problems inherent in the instrumental analysis of intonation. The problems are illustrated by a detailed analysis of one intonation contour in American English. The material studied consisted of two sets of data. The first set involved 1263 sentences recorded by one speaker with determined stress and pitch patterns. The sentences consisted of 1263 CNC words produced in an identical frame, with primary stress and the peak of the intonation contour occurring on the CNC word in the frame. The second set of frame sentences involved a subset of 70 minimally different words, uttered by five different speakers of the same general dialect. The fundamental frequency values for the various levels of the intonation contour were measured from narrow-band sound spectrograms and the measurements were correlated with the segmental phonetic structure of the sentences in which the intonation contour was produced. The intrinsic fundamental frequencies of the various syllabic nuclei and the influence of preceding and following consonants are described. The relationships among successive intonation levels are discussed. *(Authors' summary)*

1523. LIST, G., Archiving sound recordings. *Phonetica*, 6, 1861, 18-31.

"'Archiving' is a term used to cover a large number of operations or processes, ranging from the recording of materials in the field to the carrying out of detailed studies of these materials. This discussion is concerned with the indispensable intervening steps, the proper preservation and storage of the recordings accessioned and the means by which these recordings may be made readily accessible for study." Methods of preserving sound, types and extent of documentation, legal problems, and indexing are discussed. Proposed classifications are given in four appendices. *(J.D.S.)*

1524. REEDS, J. A., and WANG, W. S.-Y., The perception of stops after s*. *Phonetica*, 6, 1961, 78-81.

In initial position in English, the so-called voiced stop consonants are frequently not voiced whereas the unvoiced stops are always aspirated. This suggests that aspiration is a more dominant cue than voicing in the perceptual separation of these two classes of stops. The stops after word-initial *s* are neither voiced nor aspirated. We would expect, then, that they would be identified with the voiced stops. This expectation is fully supported by the results of a tape-splicing experiment involving listener judgment. *(Authors' summary)*

SEMANTICS

1525. BRUCE, D. J., Some characteristics of word classification. *Lang. Speech*, 4, 1961, 1-17.

An exploratory study is reported which investigates the effect of given structure on word classification. Subjects have to complete, by selection from a number of alternative items, a word list whose initial entries are systematically varied in relative position from subject to subject. The alternative items fall into three reference categories, Vegetables, Birds and Mammals, but only two are represented by the given entries. The hypothesis that the positional relation of the given words will influence completion strategy is confirmed and there is some indication of the effect of increasing the initial representation of one of the given topics. The relation between use of the given topic and separation from the given item in subjects' completions is described, and attention is drawn to an underlying consistency in the grouping shown by many of the classifications. *(Author's summary)*

1526. CASTANEDA, A., FAHEL, L. S., and ODOM, R., Associative characteristics of sixty-three adjectives and their relation to verbal paired-associate learning in children. *Child Develpmt*, 32, 1961, 297-304.

Sixty-three common adjectives were presented to a sample of 82 fourth, fifth, and sixth grade children. The S's were required to call out words that each adjective made them think of within the 8 sec interval in which the adjective was presented. The list of adjectives and the associative responses obtained are presented in the article. From this list, two sets of six word pairs were constructed. In one set the pairs had high association values while in the other set the association values were low. 50 fifth and sixth grade S's were randomly placed into one of two groups. Each group was required to learn

the paired associates of one of the newly formed lists. The group which learned the list having high association values required less than half as many trials as the group which learned pairs having low association values. *(J.W.H.)*

1527. ERVIN, S. M., and FOSTER, G., The development of meaning in children's descriptive terms. *J. abnorm. soc. Psychol.*, 61, 1960, 271-275.

The physical dimensions of size, weight, and strength are empirically correlated. If the correlation delays discrimination of these attributes as referents for descriptive terms, then younger children should more often use incorrect terms to describe differences between objects. The terms *good*, *pretty*, *clean*, and *happy* should also be used as synonyms prior to differentiation. A set of materials was prepared in which size, weight, and strength were independently varied in pairs of objects. First-grade children more often than sixth graders said that the pairs of objects differed on other dimensions in addition to the attribute actually contrasted. In a set of pictures of faces, over half of the youngest children treated *good*, *pretty*, and *happy* as interchangeable synonyms. The proportion dropped markedly with age. The more easily identified traits, such as the referents of *big* and *clean*, were least often confused with other attributes. The results are interpreted as showing that attributes which have metaphorical and connotative links in adult usage, may be deonotatively confused at first. The factors found by Osgood on the semantic differential studies of verbal meaning may actually be the referents for several terms used as synonyms, prior to differentiation of finer distinctions between attributes. *(Authors' summary)*

1528. FUHRER, M. J., and ERIKSEN, C. W., The unconscious perception of the meaning of verbal stimuli. *J. abnorm. soc. Psychol.*, 61, 1960, 432-439.

The hypothesis was investigated that the meaning of a verbal stimulus may be responded to without prior recognition of the stimulus. Four treatment groups were employed of 16 Ss each. The experimental procedure used in the first two groups was very similar to that previously used by Dixon. The procedure consisted essentially of obtaining the S's guesses to a series of verbal stimuli, dichotomized in affective connotation, which were presented at or slightly below the S's previously determined absolute threshold. The results from these two groups were consistently at variance with results obtained by Dixon, for there was no evidence that the Ss could make better than chance matches. In the third treatment group, the same stimuli were presented at a higher level of illumination, such that 13% of the Ss' guesses were correct identifications of the stimuli. The list of items to which the Ss subsequently matched their guesses contained not only the 10 original stimuli, but also 10 additional items that were structural counterparts of the original stimuli, but reversed in affective connotation. A fourth treatment group made guesses to stimuli that were presented upside down and backwards to preclude the possibility that responses were made to the meaning of the stimuli. While both groups were able to make better than chance matches, the groups' performances did not significantly differ. Both groups were predominantly responding to structural differences among the stimuli, particularly to the markedly different length of the stimuli. It was concluded that no evidence was obtained that Ss respond to the meaning of verbal stimuli prior to recognition of the stimuli. *(Authors' summary)*

Speech and Language Development

1529. CHURCH, J., Language and the discovery of reality. New York: Random House, 1961. Pp 245.

The author presents the principles of cognitive development—the term cognitive referring to the ways an individual perceives, conceptualizes, and thinks about reality. He begins with the preverbal experience of the child and goes on to describe the acquisition of language and the transformation in human functioning made possible by language. Later chapters are concerned with the problems of meaning and reference, the relationships of language and thinking, the assessment of intelligence, and the problems of emotion and motivation. The final chapter includes a discussion of the cognitive viewpoint relative to the theoretical orientations pre-

vailing in psychology today. 279 references. *(E.O.)*

1530. GANKOVA, Z. A., On the interrelation of action, image, and speech in the thinking or preschool age children. *Voprosy Psikhol.*, 1, 1960, 69-77.

This is an attempt experimentally to show that the forms of child thinking, viz., visual-active, visual-imaginative, action- and image-based verbal, are not only consecutive stages in the development of thinking but also depend on the nature of problems facing the child and on his efforts in solving them. According to the author the transfer from visual-active to verbal-conceptual thinking is not a mere transition from a lower to higher level, for it involves the development of all types of thinking and the change in the relation between them. It has been found, in particular, that verbal thinking which acquires a dominant role in senior preschool age children is represented at earlier stages. *(Child Develmpt Abst. Bibl.)*

1531. IMEDADZE, N. V., On the psychological nature of early bilingualism. *Voprosy Psikhol.*, 1, 1960, 60-68.

The analysis of the observations carried on a child who was simultaneously learning two languages (in our case Georgian and Russian) shows that in the speech development of a bilingual child two stages may be distinguished: (a) the mixed speech stage during which the child uses the elements of both languages indiscriminately, (b) the stage of gradual separation and parallel formation of the two linguistic systems, in the process of which identical phonetic, lexical, and grammatical forms are learned simultaneously without inhibition, whereas different forms of both the languages hinder each other. As time goes on more autonomy of systems is developed. The psychological mechanism of this process may be described as the working out and differentiation of the diffuse speech set (ganzhoba) into the set for speaking Georgian and Russian. *(Child Develmpt Abst. Bibl.)*

1532. KOPPITZ, E. M., MARDIS, V., and STEPHENS, T., A note on screening school beginners with the Bender Gestalt Test. *J. educ. Psychol.*, 52, 1961, 80-81.

The Bender Gestalt test and the Lee-Clark Reading Readiness Test or the Metropolitan Readiness Test, respectively, were administered to 272 beginning first grade students. Test scores were correlated with each other and with actual achievement at the end of the school year. It was found that the Bender correlates well with the readiness tests and can predict actual achievement as well as they can. *(Authors' summary)*

1533. LUCHSINGER, V. R., Die Sprachentwicklung von ein- und zweieiigen Zwillingen und die Vererbung von Sprachstörungen in den ersten drei Lebensjahren. (The speech development of monozygotic and dizygotic twins and the inheritance of speech disorders [observed] in the first three years of life.) *Folia phoniat.*, 13, 1961, 66-76.

Observations of the linguistic development of monozygotic and dizygotic twins and case histories of language development disorders in infancy are reported. A similarity in the language development of monozygotic twins is noted; varying degrees of difference in the language development of dizygotic twins are noted. *(J.B.R.)*

1534. McLAURIN, J. W., and LAGUAITE, J. K., The problem of the inarticulate child. *Hearing Eye*, 27(2), 1959, 22-23.

A reference chart that briefly compares the normal, hearing impaired, mentally retarded, emotionally disturbed and the brain damaged child in relation to response to sound, speech development, use of speech and vocalization, motor development, social and emotional maturity, and other behavioral characteristics is from a pamphlet prepared by the authors from H. R. Myklebust's *Auditory Disorders in Children*, 1954. *(W.A.B.)*

1535. MOORE, L. M., Language. In *Proc. 39th Meet. Conv. Amer. Instr. Deaf.* Washington, D. C.: USGPO, No. 62, 1960. Pp 115-120.

The methods of teaching language in the past are briefly contrasted with modern methods. The author strongly supports activity programs emphasizing content of language rather than its forms. It is pointed

out that such an approach requires interested, resourceful teachers. The 11 general principles basic to a language program given by Dawson and Zollinger are quoted. *(M.V.)*

1536. MUNKRES, A., Helping children in oral communication. New York: Teachers College Columbia U., 1959. Pp 102.

This booklet is designed to help the elementary school teacher teach effective methods of oral expression. Attention is given the varieties of problems the elementary classroom teacher faces with the silent child, the rambling speaker, and others awkward in speaking before groups. The author gives suggestions for oral communication through conversing, discussing, story telling, reporting, making speeches, dramatizing and using words well. *(P.W.N.)*

1537. POTTER LANGMAN, M., L'acquisition de la lecture: approche descriptive multidimensionnelle. (The reading process: a descriptive interdisciplinary approach.) *Genet. psychol. Monogr.*, 62(1), 1960, 3-40.

There is no reason why the linguistic ability should not be spread over humanity according to a Gauss curve, and in that case the subjects placed at the lower end of the curve do not, in fact, show any serious difficulties in learning to speak. Speech seems so natural that it is only for the last few years that standardized speech samples have been available. The aim of the author is to show the complexity of the reading and acquisition process and to describe the other difficulties of categorical thought and generalization which add to the formed difficulties, except in cases of definite and selective pathology. The behavior disorders which so often accompany reading retardation are perhaps not so much a reaction as another component of the inability to generalize, to apply old knowledge to new situations. Early detection of these cases is indispensable if the children are to benefit by a concrete program of appropriate education. *(Courrier)*

1538. RADAKER, L. D., The visual imagery of retarded children and the relationship to memory for word forms. *Except. Child.*, 27, 1961, 524-530.

Describes the design and procedure of an experimental study of the possibilities of imagery training for retarded children. Results indicated a relatively uniform improvement among most of the 15 children assigned to practice groups. Training apparently permitted children to obtain sharply defined images of words and to discriminate words more effectively. It is suggested that imagery training might prove useful in school subjects other than the language arts since retarded children appear to respond well to such training. The Memory for Word Forms Test, compiled by the writer, is included. *(Rehab. Lit.)*

1539. RUNQUIST, W. N., and HUTT, V. H., Verbal concept learning in high school students with pictorial and verbal representation of stimuli. *J. educ. Psychol.*, 52, 1961, 108-111.

This study was undertaken "to compare the learning of verbal concepts with pictorial representation of stimuli with the more standard verbal representation." A factorial design was employed with three modes of presentation and four school grade levels. The grade levels were 9 through 12 inclusive. The modes of presentation were (a) Verbal (name of object printed on card in black india ink), (b) Picture Dominant (line drawing of object in black india ink with correct concept association emphasized in drawing), and (c) Picture Nondominant (line drawing of object in black india ink with correct concept de-emphasized in drawing). Differences among grade levels and differences among modes of presentation were significant. The interaction between grade levels and modes of presentation was not significant although a graph of the results suggests that it might be. Concept learning was best in this study when the stimuli were presented as words. The mode of presentation which was next highest was the instance in which picture stimuli were presented with the concept accentuated. According to the authors, "the results were attributed to the nature of the specific concepts studied, and it was concluded that in all likelihood no simple answer to the question of which type of presentation of instances is superior can be obtained." *(J.W.H.)*

1540. RUSSELL, D. H., and RUSSELL, E. F., Listening aids through the grades. New York: Teachers College Columbia U., 1959. Pp 108.

The authors of this booklet which is patterned after the book entitled Reading Aids Through the Grades, believe that learning to listen with comprehension to spoken language can and should be guided, hastened, and reinforced by systematic instruction. Material for instructional activities in the elementary and intermediate grades is here made available to teachers and students. Exercises in phonics and word analysis, rhyming games, interviews, dramatic performances, choral reading, analyses of TV and radio programs are representative of the varieties of the activities contained. *(P.W.N.)*

1541. WILLIAMS, W. G., The adequacy and usefulness of an objective language scale when administered to elementary school children. *J. educ. Res.*, 54, 1960, 30-33.

140 children, aged five through 12, were randomly selected for a study to appraise the adequacy and usefulness of an objective scale designed to measure language development. The scale is a modification of one developed by Mechan. The results of the study support the usefulness of the scale. *(Child Develmpt Abst.)*

VOICE

1542. LANE, H. L., CATANIA, A. C., and STEVENS, S.S., Voice level: autophonic scale, perceived loudness, and effects of sidetone. *J. acoust. Soc. Amer.*, 33, 1961, 160-167.

The question asked by the present study is whether a loudness scale based on a subject's impression of his own voice is the same as that based on his judgment of another's voice. The disparity found between these two loudness scales suggests that the speaker depends on factors other than the perceived loudness of his own voice in regulating his vocal output. *(B.A.L.)*

1543. LUCHSINGER, V. R., and PFISTER, K., Die Messung der Stimmlippenverlangerung beim Steigern der Tonhöhe. (The measurement of the lengthening of the vocal folds during pitch change.) *Folia phoniat.*, 13, 1961, 1-12.

A trained female singer is used as a subject and certain criteria are employed (painting black dots on the sides of the larynx and on the vocal folds; recording the intensity of the voice, which was kept as level as possible) to measure the dependence of the length of the vocal folds upon pitch in sliding tones. The measurement showed that over an octave . . . a change occurred in the length of the vocal folds with the rise and fall of pitch at . . . point between the arytenoids and the middle region of the vocal folds. *(Authors' summary)*

SPEECH DISORDERS

APHASIA

1544. COSTA, M. A. R., Estudo do teste para afásicos de Jon Eisenson e sua aplicaçao a crianças surdas Portuguesas. (A study of the test for aphasia by Jon Eisenson and its application to deaf Portuguese children.) *Criança Surda*, 5, 1960, 35-58.

The author analyzes the problem of aphasia in children through Jon Eisenson test. 255 deaf children were observed and 19 were found aphasic. All deaf children in schools in Lisbon were observed. Education of the deaf is a difficult work and it is necessary to recognize the aphasics and to distinguish the different types. The author presents some different types of aphasics. *(Author's summary)*

1545. FINK, S. L., The clinical psychologist evaluates aphasia rehabilitation. *Asha*, 3, 1961, 177-179.

The purpose is to integrate the psychologist's conception of aphasia, to evaluate the team approach, and to suggest guides in the use of this approach. The team approach has definite values and dangers to the aphasic. The relationship between the speech pathologist and the aphasic is crucial because of the importance of verbal communication in everyday life. Ample opportunity for developing a proper relationship between the speech therapist and the aphasic patient is very important. This procedure would give considerably greater freedom and independence to the speech pathologist. This relationship must exist for success and the speech therapist must not be merely "an applier" of routine techniques. The team approach can work best

when there is mutual respect on a part of the team members for the relative competence for one another's ability within his own sphere. *(S.H.A.)*

1546. HUGHES, T. M., Guidelines for aphasia. *Amer. Arch. Rehab. Ther.*, 9(1), 1961, 4-10.

An educational therapist at the VA Hospital, Memphis, discusses the purpose, organization, and methods of aphasia therapeutics used in the hospital's speech therapy clinic. As teachers trained to instruct in the language arts, educational therapists could actively participate in the administration of speech correction programs for aphasics. Tables of data classifying 258 speech patients and results achieved or expected are included. *(Rehab. Lit.)*

1547. INGRAM, T. T. S., Pediatric aspects of specific developmental dysphasia, dyslexia and dysgraphia. *Cerebral Palsy Bull.*, 2, 1960, 254-277.

The three conditions all represent disturbances in the development of particular language functions; they are closely related and in many respects show similarity in etiology and clinical findings. The author reviews the literature concerning each condition in regard to differential diagnosis, etiology, associated clinical features, and psychiatric symptoms. The importance of psychological testing in the diagnosis of each syndrome is emphasized. In spite of the close association claimed for these disorders, there is still a tendency to regard them as separate entities, rather than different manifestations of disordered speech and language development. The rational treatment of dyslalia, idioglossia, or dyslexia requires a knowledge of the functional nature of the disorders. *(Rehab. Lit.)*

1548. OLSON, J. L., Differential diagnosis: deaf and sensory aphasic children. *Except. Child.*, 27, 1961, 422-424.

Describes briefly a newly standardized test for young children, the Illinois Test of Language Ability, and its usefulness in differential diagnosis. Results of testing 25 deaf children and 27 with sensory aphasia are discussed. On four of the nine subtests deaf children scored significantly higher than aphasics; differences were group differences, not differences between individual children. *(Rehab. Lit.)*

1549. WERTHEIM, N., and BOTEZ, M. I., Receptive amusia: a clinical analysis. *Brain*, 84, 1961, 19-30.

A case history of a 40 year old, right handed violin player with predominantly receptive dysphasia and a right hemiplegia is presented. The results of extensive language testing and a battery of tests designed to measure music ability are discussed. This patient was of specific interest because testing revealed a deficit in music ability following his CVA. Particular note was made of the loss of the patient's ability to perceive absolute pitch. 17 references. *(B.S.S.)*

Articulation Disorders

1550. ALAJOUANINE, T., and SABOURAD, O., Les perturbations paroxystiques de langage dans l'épilepsia (étude clinique). [Paroxystic perturbations of speech in epilepsy (clinical study).] *Encéphale*, 49(2), 1960, 95-133.

The authors show that there is a great variety of speech disorders some of which have no topographic significance, while others amount to a paroxystic dysarthia, others still to an aphasia of left temporal origin and finally, the significance of some disorders such as attacks of palilalia is still uncertain. *(Courrier)*

1551. KOOP, C. E., and MOSCHAKIS, E. A., Capillary lymphangioma of the tongue complicated by glossitis. *Pediatrics*, 27, 1961, 800-810.

Clinical characteristics and treatment are discussed. Several case reports are given. Defective speech attended several cases, others maintained normal speech throughout surgical and other treatment procedures. *(N.J.C.)*

1552. MARQUARDT, W. F., The speech problems of the foreign students learning English. *Asha*, 3, 1961, 180-184.

This article summarizes some of the literature regarding the teaching of English to foreign students. Ten major problems are identified. Sources for discussions of the nature of language, principals of language learning, problems of mastering the sound system, problems of testing physiological factors effecting speech, culture and speech problems, geography and speech problems, speech proficiency and realiza-

tion of goals, and research considerations are presented. *(S.H.A.)*

CEREBRAL PALSY

1553. DENHOFF, E., Emotional and psychological background of the neurologically handicapped child. *Except. Child.* 27, 347-349.

The author emphasizes that teacher, therapist and physician must formulate a total plan of treatment to attack all phases of the problem. The treatment must be correlated with sequences of development and also include familial problems. The role of heredity, environment, organic brain dysfunction, psychological factors and sensory deprivation is discussed. *(E.H.N.)*

1554. FISCH, L., and BACK, D. E., The assessment of hearing in young cerebral palsied children. *Cerebral Palsy Bull.*, 3, 1961, 145-156.

Regular weekly hearing testing and observation for all cerebral palsied children attending the Centre for Spastic Children, London, was begun in February, 1956; 76 children were tested between 1956 and 1958. The study attempted to assess the practical difficulties of testing children under five years of age and the time required to reach a final conclusion concerning their hearing. Methods of testing hearing in small cerebral palsied children are reviewed, with suggestions for overcoming various testing difficulties. Low mental ability and degree of physical handicap were the two most important factors influencing time required for full assessment. It is recommended that all cerebral palsied children should be routinely tested whether deafness is suspected or not. *(Rehab. Lit.)*

1555. GALLAGHER, J. J., The tutoring of brain-injured mentally retarded children. Springfield, Ill.: Charles C. Thomas, 1960. Pp 194.

This book is the result of an experiment designed to discover whether psychological and educational patterns of brain-injured, mentally, retarded children could be significantly modified through individual tutoring. The subjects were institutionalized brain-injured children ranging in age from 7.3 years to 13.7 years. The diagnosis of brain injury was based upon the independent judgment of two judges and was verified in each case by a complete neurological work-up. The children were divided into two groups, 21 in each. The two groups were matched as to MA scores on the Stanford-Binet (Form L) intelligence test. Pairs whose MA were closest together were assigned by chance to an experimental or control group. MA ranged from 48 to 82 months for the experimental group, with a mean of 61.65 months. The MA of the control group ranged from 33 to 79 months, with a mean of 60.37 months. Group E (experimental) received two years of tutoring and then one year of no tutoring. Group C (control) received two years of no tutoring and then one year of tutoring. Tutoring consisted generally of instruction in perceptual skills, language skills, memory skills, and conceptualization and reasoning. A comprehensive battery of tests was given at the beginning of the experiment and at one year intervals thereafter for four years. The results of the three-year experiment are presented, and six cases are discussed in detail to illustrate the range of response to the program. Reasons for improvement or lack of improvement in each case are speculated. Implications of the study in respect to education, psychology, physiology and neurology, and future research are elaborated. *(M.M.)*

1556. HECAEN, H., and ANGELERGUES, R., Epilepsie et troubles du langage. (Epilepsy and speech disorders.) *Encéphale*, 49(2), 1960, 138-169.

Among 208 clinical observations, the authors have noted a disorder of spoken or written speech (before, during and after the seizure) in 176 cases and a verbal automatism in 32 observations. The arrest of speech (96 cases) is by far the most frequent manifestation, but verbal deafness was found in 52 cases. It is between these two varieties that association occurs most frequently. *(Courrier)*

1557. INGRAM, T. T. S., and BARN, J., A description and classification of common speech disorders associated with cerebral palsy. *Cerebral Palsy Bull.*, 3, 1961, 57-69.

From an analysis of examination results in 258 children with cerebral palsy seen in the Speech Clinic, Royal Hospital for Sick Children, Edinburgh, the writers classified

speech disorders found associated with various forms of cerebral palsy. Classifications of speech defects and of cerebral palsy, found useful in Edinburgh clinics, are described. The establishment of an acceptable classification of speech disorders is essential for accurate diagnosis; it should comprehensively cover anatomical, neurological, and psychological aspects of speech disorders. *(Rehab. Lit.)*

1558. IRWIN, O. C., A short vowel test for use with children with cerebral palsy. *Cerebral Palsy Rev.*, 21(4), 1960, 3-4.

A test of 11 vowel sounds in the initial and medial positions in words was administered to 492 cerebral palsied children, three to 16 years, in 23 states. The range of difficulty of the items was found to be 76 to 93%, i.e., these children seemed to articulate vowel sounds more easily than consonants. However, this is too narrow a range for test purposes. "A preferable range might be from 10 or 15% to 85 or 90% with the mean in the neighborhood of 50%. It is also possible that the vowel sounds in the second syllable of polysyllable words would provide a wider range of the difficulties of these phonemes." *(Child Develmpt Abst. Bibl.)*

1559. IRWIN, O. C., Articulation correcte des voyelles dans le langage d'enfants IMC. (Correct status of vowels in the speech of children with cerebral palsy.) *Cerebral Palsy Rev.*, 21(5), 1960, 6-7, 11.

The study devoted to the ability of these children to pronounce vowels shows that sex does not influence the performances and that there is no correlation with the chronological or mental age or the IQ. This confirms previous observations on consonants. The tests of spastic children are better than those of athetoid children, no significant difference having been observed between quadriplegic, paraplegic and hemiplegic children. *(Courrier)*

1560. LEANING, P. A., The challenge of cerebral palsy. Auckland, New Zealand: The Author, 1958. Pp 97.

This book is based largely upon the author's experiences during a world tour of various cerebral palsy facilities. It is written from the point of view of a teacher and also one who has been a victim of cerebral palsy. A first responsibility in education is to see that the CP child is happy in order that he may do his best. Steps in planning include (a) parent guidance, (b) complete evaluation of the child, and (c) program planning. Continual re-evaluation, observation and accumulation of data are imperative to progressive planning. CP children usually need specialized teaching in small classes designed specifically for them. Education should begin early so that he becomes aware of environment and relationships, concepts from a very early age. The teacher must have the capacity for self-direction, experimentation and resourcefulness. Above all, she must have stability in her own personal adjustment. The team approach is imperative with all disciplines involved, including the social worker (often omitted from the team). Psychological evaluation is difficult at best and must be preceded or supplemented by observation of skills and responses which the child can perform as part of his daily living. Play is essential for CP children to bring creativity, experimentation, spontaneity and relaxation. Motivation does not come from forcing the child's behavior but rather from a feeling of mastery and adequacy in some way or another. Discipline by censorship or punishment often prevents a child from getting out his pent-up feelings, thus behavior problems begin. Quietness and firmness are keys to discipline. Basic academic subjects as well as related activities of speech therapy, OT, PT, vocational and parental guidance are discussed in some detail. This book was intended primarily for teachers and parents. *(M.J.M.)*

1561. LEWIS, R. S., STRAUSS, A. A., and LEHTINEN, L. E., The other child—the brain-injured child. New York: Grune & Stratton, 1960. Pp 148. (rev.)

The education of the brain-injured child should start as early as possible. The chief objective is to reduce "otherness," namely, to help the child to fit into society with considerable independence. Brain-injured children have difficulty organizing stimuli into proper foreground-background relationships, hence resulting in an endless sequence of perceptual errors. In addition, the brain-injured child may perceive parts of a figure but not the whole. Therefore, because of perceptual disturbances which may

include the auditory, tactual, etc., as well as the visual, the regular school programs will not be appropriate for the brain-damaged child. He must be taught to perceive, and the sooner his difficulty is recognized, the greater is the chance for successful learning. Disturbances in figure-ground relationships as observed in the brain-damaged child may be diagnosed incorrectly as a limited attention span when in reality it is an involuntary shift in the focus of attention. The educational procedure in such cases requires a highly structured learning situation with a minimum of distracting stimuli. Inability to conceptualize is frequently contingent upon faulty perceptions and poor construction of reality. One of the most important aspects of conception is the ability to generalize, an area in which the brain-damaged child is noticeably weak. The fact that brain-damaged children are often reported to have exceptionally good memories is possibly related to their inability to generalize, and "thus lose particulars in the larger framework of a generalization." The capacity to develop language is inherent in human beings. However, language must be learned. English is one of the most difficult languages because it is not pure. For this reason, then, additional problems are encountered by the brain-damaged child in an English-speaking milieu. Other chapters in the book pertain to behaviour, management and education. *(C.P.G.)*

1562. RUSSELL, E. M., Cerebral Palsied twins. *Arch. Dis. Childh.*, 36(187), 1961, 329-336.

Of 488 cerebral palsied patients seen in the Edinburgh (Scotland) Clinic, 44 (9%) were one of twins. A matched study with 44 control twins permitted comparison between the cerebral palsied child and (a) his twin and (b) the control twins. The CP twin tended to be diplegic (all four limbs involved, but legs more involved than arms) and premature (in terms of birth weight). Of the other 44 twins of the CP group, less than half were surviving and healthy. In the experimental twins (one of which was CP) there was a greater than expected incidence of like-sexed pairs. The CP twin tended to be first-born, and non-surviving twins tended to be second-born. CP patients had more abnormal neonatal signs than their surviving twins or the control twins. The CP twins had a greater tendency to have I.Q.'s below 80 (57%), visual defects (36%), difficulty in hearing (9%), speech defects (61%), epilepsy (20%). The author concludes that the cerebral defect in the CP twins is not related to abnormalities of pregnancy and parturition or to maternal age, but to low birth weight. *(J.C.S.)*

Cleft Palate

1563. CROATTO, L., and MARTINOLLI, C. C., L'Intervento di sinechia velo-faringea nella correzione chirurgica delle gravi insufficienze velari. (Operation of velo-pharyngeal fusion for the surgical correction of grave cases of velar insufficiency.) *Bol. Soc. Ital. Fonet. Foniat. Audiol.*, 10(1), 1960, 27-39.

The authors describe their operative procedure of mobilizing [a "lappan" of] the posterior wall of the upper pharynx and suturing it to the prepared nasal surface of the palate. 27 patients were operated on. Before the operation none of the cases showed normal speech, 6 showed nasality and 21 showed nasality and defects or articulation. After the operation 9 patients had normal speech, 10 continued showing nasality and 8 cases showed both nasality and articulatory defects. The cases were also analyzed from the standpoint of nasal breathing and other phonetic principles. 15 references. *(D.A.W.)*

1564. FITCH, N. Embryological analysis of a new cleft palate gene in the house mouse. *Anat. Rec.*, 136, 1960, 194.

The morphological effects of a new recessive gene in the house mouse, *shorthead*, have been observed in newborns and analyzed during the embryonic period. The newborn mutant, which dies within a few hours, is characterized by a large median cleft palate, foreshortened head, abnormally shaped limbs and cyanotic appearance. The intestine is reduced from one-third to one-half its normal length. Alizarin stained, cleared specimens reveal abnormalities in the size and shape of many bones in the skull, limbs and sternum. The morphological origin of the head abnormalities was traced by studying the shorthead embryos at different stages of development. Head size was reduced and development of the tongue

was retarded in embryos as early as the twelfth day of fetal life. By the 14th day, the tongue abnormalities had become more pronounced. In these mutants, the tongue was about one-half its normal length, and was located much closer to the roof of the mouth than in the normal embryo. The palatal processes extended beneath the tongue, a condition never observed in the normal embryo. These observations suggest that the abnormal size and position of the tongue are primary factors in preventing normal palatal closure. *(Author's summary)*

1565. LORETZ, W., WESTMORELAND, W. W., and RICHARDS, L. F., A Study of cleft lip and cleft palate births in California, 1955. *Amer. J. Public Hlth.*, 51, 1961, 873-877.

The study reports on the occurrence in 1955 in California of births with cleft lip and cleft palate. The data was analyzed for associated factors such as type of cleft, sex, race, age of mother, other malformations, and number of deaths occurring due to the cleft palate. A ratio of one case per 851 live births or 1.18 cases per 1,000 live births was found. *(D.A.O.)*

1566. MARKS, M., A team-work approach to cleft palate rehabilitation in South Africa. *J. S. African Logopedic Soc.*, 7(1), 1960, 8-10.

Lack of professional specialists, the facilities to train additional personnel, and the time to conduct research are special problems in considering a team approach to cleft palate rehabilitation in South Africa. Suggestions for the possible composition of a cleft palate team, its functions, and adaptations that might have to be made in applying the plan to conditions in South Africa are offered. Miss Marks bases her discussion on observations made at Northwestern University's Cleft Lip and Palate Institute, its administration, and purposes. *(Rehab. Lit.)*

1567. STRAIN, J. C., Maxillofacial prosthetics. *J. prosth. Dent.*, 11, 1961, 790-793.

The author discusses congenital and acquired maxillofacial defects and their treatment. The etiology of congenital cleft palate anomalies are reviewed and the types of prosthetic appliances that can be used for their correction is presented. The treatment of acquired anomalies requiring orofacial prostheses is difficult, especially when flexible margins are necessary. The art of applying make-up is important. In those cases where surgical implants are used a dentist is an important member of the surgical team. *(A.K.K.)*

DELAYED SPEECH

1568. HIRSCH, K. de, Studies in tachyphemia: IV. diagnosis of developmental language disorders. *Logos*, 4, 1961, 3-9.

The author feels there is a relationship between the functional speech problem found in the three to six year age group and the severe reading, spelling, and writing problems found in children between seven and 12 years. Particularly in children of normal intelligence, the author has observed that many of the children in the younger group with delayed speech development later were found to have difficulty in reading. A distinctive pattern of performance has been identified, making it possible to predict which children in the three to six year group will have reading difficulties. The diagnostic procedures include a detailed family history of language difficulties and neo-natal, natal, and post-natal history of the child. Over-all motility patterns of the child are observed (especially important is a tendency to be hyperkinetic). Finer manual control is tested. Body image is observed by examining figure drawings of the child. The Bender Gestalt test is given to test visuo-motor organization. Other factors observed include spatial organization, figure-ground organization and receptive language, expressive language and conceptualization. Early diagnosis of these children is considered essential, since therapy needs "to be directed towards the basic organizational weakness in patterning and the child has to be helped early to structure motor, perceptual, and . . . behavioral configurations" and since the youngster needs to be protected against anxiety engendered by his disorganization and helped to cope with the repercussions of his environment to his original disabilities. *(H.L.L.)*

1569. MUSSAFIA, M., Retard (simple) du language chez des triplés. (Delayed language development of triplets.) *Folia phoniat.*, 13, 1961, 62-65.

A case history of five-year-old triplets with severely retarded speech development

is reported. They communicated among themselves but their speech was completely unintelligble to other persons. Treatment consisted of sending the children to separate nursery schools for social adjustment. A similar delay was noted in a younger child of the family. The similarity of the speech disorders may suggest a hereditary speech retardation. *(J.B.R.)*

1570. STEISEL, I. M., WEILAND, I. H., DENNY, J. V., SMITH, K., and CHAIKEN, N., Measuring interaction in nonverbal psychotic children. *Amer. J. Orthopsychiat.*, 30, 1960, 405-411.

This is a progress report on one phase of a multifaceted approach to obtaining satisfactory measures of change in nonverbal psychotic children. The focus has been on establishing a simple standardized experimental situation which would allow for observing the child's ability to interact when alone with an adult, and a scale that can supply precise, reliable and meaningful measures of this interaction. The experimental procedure is divided into three distinct phases: (a) interaction is solicited by the experimenter, (b) interaction is rejected by the adult, and (c) interaction attempts by the child are awaited. During the session two trained observers score the child's behavior on seven five-point scales which describe the degree and, to some extent, the type of interaction demonstrated by the child. The preliminary data that have been obtained reflect some degree of observer reliability and a striking ability to differentiate psychotic from nonpsychotic children. With the techniques described here, it is felt that statements about progress (or lack of it) as a consequence of drugs, psychotherapy, etc., can be placed on a surer footing than has been possible in the past. *(Child Develmpt Abst. Bibl.)*

1571. WOOD, N. E., Language disorders in children. Chicago: The National Society for Crippled Children and Adults, Inc., 1959. Pp 32.

The monograph is based on the results of a long-term study of children with delayed speech and language, in which consecutive case histories of 1,200 children between the ages of three and six were analyzed. Information was obtained from medical reports and the results of hearing, psychological and language evaluations. More than a score of staff members, consultants and visiting lecturers aided in the organization and expedition of the study. Background and definition, diagnostic approaches and therapy procedures are covered and a bibliography is included. *(P.W.N)*

Diagnosis and Appraisal

1572. DOUGLASS, F. M., FOWLER, E. P., and RYAN, G. M., A differential study of communication disorders. St. Joseph's School for Deaf: New York, 1961. Pp 136 (mimeo.).

28 children in the St. Joseph's preschool and elementary grades (ages 3 to 8) served as subjects in this three-year study. They had been diagnosed as anacusic (10 cases), acquired expressive aphasia (1 case), and dysacusic or hypacusic with, in some cases, emotional disturbance (17 cases). The purposes of the project were (a) to determine the reliability and validity of initial diagnoses based on criteria used by the Columbia-Presbyterian Medical Center and (b) to investigate various educational approaches to these children. Diagnoses made prior to three years of age appear to be reliable from the experiences of this project. However, "Despite the general validity of the diagnostic procedures, and of the individual diagnoses, little can be said as to the relationship between diagnostic factors and prognoses for individual dysacusic children." As for the educational phase of the project, "It has been possible to demonstrate that all children in the Project made progress, especially in environmental adjustment and self-control, reduction of hyperactivity or distractibility, and in capacity for independent activity." 94 references. *(J.D.S.)*

1573. HAMLIN, R. M., and KINDER, E. F., Vocabulary deficit in brain operated schizophrenics. *J. consult. Psychol.*, 25, 1961, 239-244.

The study considered the effect of test procedure on measures of vocabulary deficit eight and ten years after bilateral topectomy. Three vocabulary tests, each employing the same words, were given to 21 operates and 19 controls. The three tests were a multiple-choice test maximizing the necessity for sustained attention, an oral test, and a multiple-choice test minimizing

the importance of attention. The topectomized schizophrenics showed a consistent tendency to vocabulary deficit on all tests. Vocabulary deficit was greater and most significant on the multiple-choice procedure which minimized attention and which was given after the other two tests. The results suggest that the test procedure used may be an important factor in studies of vocabulary deficit. Relevant considerations include both the test format and the order of presentation. *(B.S.S.)*

1574. HIRSCHENFANG, S., Further studies on the Columbia Mental Maturity Scale (CMMS) and Revised Stanford-Binet (L) in children with speech disorders. *J. clin. Psychol.*, 17, 1961, 171.

A report of an evaluation of the revised version of the Columbia Mental Maturity Scale in a hearing and speech clinic setting. In a comparison of scores from 45 Revised Stanford-Binet (L) and CMMS records of children from 3.41 to 14.58 years of age, correlations of results was high enough to warrant the assumption that both tests can be used in estimating intellectual functioning of children with speech disorders. However the CMMS appeared to penalize children below 3½ years of age as it tends to be more difficult for them to comprehend what is expected of them. Further revision of CMMS scoring is seen as necessary. *(Rehab. Lit.)*

1575. INGRAM, T. T. S., A description and classification of the common disorders of speech in children. *Arch. Dis. Childh.*, 34, 1959, 444-455.

Descriptions of the commoner defects of speech encountered in a hospital speech clinic largely devoted to the treatment of preschool children have been presented. A new classification of speech disorders in childhood based on the major defect of speech and an associated clinical and psychological findings is given. It is emphasized that accurate diagnosis and classification of speech defects requires a team consisting of speech therapist, psychologist, pediatrician and otologist. The help of a social worker, neurologist, phonetician, child psychiatrist and other hospital staff may be required in both diagnosis and treatment. Criticisms are made of the classification of speech defects proposed by Morley (1957) on the grounds of the imprecise use of a few neurological terms and the lack of clear definition of some of the categories proposed, in terms of clinical findings. *(Child Develmpt Abst. Bibl.)*

1576. OGLES, C. M., Procedures in discovering persons with communication problems. *Hearing News*, 29(3), 1961, 9-12.

The purpose of this paper is to present some of the problems in early discovery of individuals with communication problems. The author states that it is imperative that the person in need of services and the community resources providing rehabilitation services be brought together as early as possible. Ogles reports that hearing loss represents 24.4% of the noninstitutionalized disabled population in the United States today. At the recent White House Conference on Aging, only one of the 3000 delegates asked to be assigned to the workshop on hearing. This shows a significant need for greater educative efforts to bring communication problems into proper perspective in the community. A study by the Federal Office of Vocational Rehabilitation indicates that 2,992 hard of hearing adults were rehabilitated over a three-year period. Of this figure, 68.9% were having communication problems a minimum of ten years prior to referral, and 47.2% were having problems 24 years prior to referral. Hearing and speech centers, physicians, hospitals and hearing aid dealers were responsible for only 13.3% of the total number of referrals. Corresponding information is reported regarding the deaf. The growing number of middle-aged and older disabled persons in our population gives us cause to reconsider the direction in which our rehabilitation efforts should go. A number of suggestions are given for improving case finding including basic fundamentals of a case-finding program, public education and information, techniques for development of referral services, desirable principles for centers in case finding and suggested procedures to increase case finding. *(J.G.A.)*

1577. PERRIA, L., ROSADINI, G., and ROSSI, G. F., Determination of side of cerebral dominance with amobarbital. *Arch. Neurol.*, 4(2), 1961, 173-181.

The authors report results of a study on 30 adult patients who were subjected to

carotid angiography. All patients had cerebral neoplasms, seizure disorders, or cerebrovascular diseases of differing natures. Changes in EEG activity, motor power, superficial plantar reflex, knee jerk, speech ability, and emotional state were checked following injection of sodium amobarbital. The technic is considered useful in neurosurgical practice. The presence or absence of speech defects and the development of an emotional reaction of the depressive or euphoric type after the injection are signs directly indicating whether the drug has interfered with the function of the dominant or the nondominant hemisphere. 13 references. *(Rehab. Lit.)*

LARYNGECTOMY

1578. ARNOLD, G. E., Alleviation of alaryngeal aphonia with the modern artificial larynx: I. Evolution of artificial speech aids and their value for rehabilitation. *Logos*, 3(2), 1960, 55-67.

A review of the development, over the last century, of the five types of artificial speaking devices: the externally applied reed larynx, internal replacement of the larynx by mechanical devices simulating all laryngeal functions, cervical applicaton of the electrolarynx, direct activation of the oral resonator by an external electrolarynx, and intraoral sound source. There is still demand for prosthetic devices among persons who, for varied geographic, economic, and physical reasons, cannot learn esophageal speech. Advantages and limitations of artificial speech aids are discussed. 102 references. *(Rehab. Lit.)*

1579. BARNEY, H. L., The new Western Electric No. 5 Type artificial larynx. *Logos*, 3(2), 1960, 68-72.

[The author] discusses engineering principles of an experimental electronic artificial larynx and the acoustic performance of the device. Intelligibility of speech is appreciably better with the electronic device than with the mechanical reed type. Reactions of the few who have used the new artificial larynx are overwhelmingly favorable. *(Rehab. Lit.)*

1580. CURRY, E. T., and SNIDECOR, J. C., Physical measurement and pitch perception in esophageal speech. *Laryngoscope*, 71, 1961, 415-424.

The mean frequency level for most esophageal speakers is one full octave below that of the normal male adult. Frequency movements, however, are similar for normal and superior esophageal speakers. "The esophageal speaker should continuously be encouraged to extend the range of frequencies used in his speaking performances; however, because of the particular frequency-pitch relationship in the frequency region of esophageal speech, the extensions of frequency range will not be as productive of perceptual variability as would be the case in the higher frequency regions characteristic of the normal speaking range." *(R.G.)*

1581. GARDNER, W. H., and HARRIS, H. E., Aids and devices for laryngectomees. *A.M.A. Arch. Otolaryngol.*, 73, 1961, 145-152.

An estimated 40% of patients who survive surgical removal of the larynx never acquire intelligible esophageal speech. A realistic attitude should be adopted regarding their needs; they should be informed of the wide variety of aids available. Discussed are: a comprehensive rehabilitation program for laryngectomees, the role of "lost chord" clubs in encouraging laryngectomized patients to learn to speak again, and adaptations in dress and personal hygiene. Case histories of eight patients illustrate a variety of problems experienced by laryngectomees and some of the solutions. *(Rehab. Lit.)*

1582. SUTER, C., Erfahrungen mit der partiellen Laryngektomie. (Results of partial laryngectomy.) *Pract. Oto-Rhino-Laryngol.*, 23, 1961, 120-127.

Concerning the increase in the incidence of recurrences after partial larygectomy, there were seven cases of local and 12 cases of regional recurrence amongst 57 cases. Three cases must be added to these, in which regional metastases were not present at operation of block dissection of the glands of the neck or at post-mortem examination. All three cases, however, had distant metastases. Total laryngectomy might have prevented recurrence in only three o the 23 cases . . . If a block dissection of the glands of the neck had been carried out at the primary operation, four cases of regional recurrence . . . and probably another . . . might have been prevented. In

five cases where the dissection of the glands was not radical enough . . . homolateral regional metastases occurred, and in three of these cases . . . radiotherapy following operation proved ineffective. With regard to increased difficulty in intake of food, dysphagia was present in 18 of the 57 cases. In two cases complete laryngectomy had to be carried out after six month and 18 months, respectively, because of repeated aspiration of food, and another patient had to feed himself with a tube after two years following the operation. As to the question of difficulty with breathing, four cases of postoperative stenosis occurred, which necessitated a tracheotomy. If for psychological reasons total laryngectomy cannot be performed, there will always be cases where the surgeon will have to decide on partial laryngectomy, providing localization and extent of the tumor allow this. Adequate dissection of the gland is of the greatest importance. If the functional result is very bad, total laryngectomy can then be carried out at a later date. *(Author's summary)*

STUTTERING

1583. HORLICK, R. S., and MILLER, M. H., A comparative personality study of a group of stutterers and hard of hearing patients. *J. gen. Psychol.*, 63, 1960, 259-266.

A report of a preliminary study of the adjustment problems of 26 stutterers and 26 hard of hearing patients referred for speech therapy; all were enlisted male military personnel. The California Test of Personality was used to determine characteristics of each group, how dependable the differences were, the extent to which stutterers and hard of hearing persons differed from a standardization group, and whether there was a characteristic basic personality structure for each group. Clinical observations and findings of the authors are not in agreement with those of previous investigators who attributed characteristic personality traits to the hard of hearing. No one characteristic pattern of adjustment for either group could be identified in this study. The literature is briefly reviewed. *(Rehab. Lit.)*

VOICE DISORDERS

1584. BRUNO, G., Modificazioni vocali in soggetti di ambo i sessi sottoposti ad altissime dosi di ormoni sessualita scopo terapeutico. (Voice changes in patients of both sexes subjected to very high doses of sexual hormones for therapeutical reasons.) *Bol. Soc. Ital. Fonet. Foniat. Audiol.*, 10(1), 1960, 78-96.

The patients were all cases of liver cirrhosis treated with excessive doses of synthetic male hormones. The phonetic observations resulted in the following conclusions: (a) male subjects with normal genital function did not show any vocal changes after application of synthetic male hormone; after 2mg. of methyltestosterone hyperesthesia of the larynx and increase of secretion were noted. (b) Male subjects with vocal and sexual difficulties showed the disappearance of both after 50 mg. of testosterone propionate. (c) In male subjects showing infantilism the synthetic male hormones led to a therapeutic mutation, pubertal change, of the voice. (d) In female patients the male hormone can cause a complete virilization of the voice or leads occasionally to an excessive elevation of pitch, resulting in a falsetto voice. These changes are in no exact relationship to the amounts of the hormone, and once established they mostly remain irreversible. As the treatment with the male hormone progressed, the male patients did not present vocal changes but complained of a chronic larynx catarrh and rare paresthesias of the pharynx and larynx. Various female hormones did not seem to have any influence on the voice. *(D.A.W.)*

1585. CERCIELLO, P., and FASANO, V. A., I disturbi della voce e della parola nelle malattie del sistema nervoso. (The voice and speech disturbance in the diseases of the nervous system.) *Bol. Soc. Ital. Fonet. Foniat. Audiol.*, 10(2), 1960, 409-532.

This report starts with a brief overview of the neurophysiology of speech and voice, mainly from Italian and French authors. In the neuropathological part the problems of aphasia are bypassed, and the main points of discussion refer to the delivery of speech (articulation, rhythm, phonation), including the paralyses of the recurrent nerve. The authors offer a schema of theoretical generalizations; e.g., the distinctions (a) cortical, pyramidal, extrapyramidal and cerebellar dysarthrias and (b) peripheral dy-

sarthrias in which they also place the nuclear ones. 173 references. *(D.A.W.)*

1586. CIURLO, E., and OTTOBONI, A., Il laringe e la voce nell'acromegalia. (The larynx and voice in acromegalies.) *Bol. Soc. Ital. Fonet. Foniat. Audiol.*, 10(1), 1960, 58-63.

Review of the earlier literature indicates mainly an increase of the size of the thyroid gland (not always connected with heightened metabolism) and, in more than 10% of the cases, the paralysis of one vocal cord. The authors examined 20 cases of acromegaly and found an increase in the size of the larynx; long thickened and unable to produce high notes; a certain weakness of the vocal cords with inability to close the glottis completely; speaking mainly in chest voice, reduction of force of the voice but an increase of the "volume" due to the bigger resonance cavities. (The authors mean probably that the voice sounds more "cavernous.") The possible hormonal relations are discussed. 23 references. *(D.A.W.)*

1587. HOWIE, T. O., LADEFOGED, P., and STARK, R. E., Congenital subglottic bars found in 3 generations of one family. *Folia phoniat.*, 13, 1961, 56-61.

A congenital sub-glottic web is noted in a girl of six years after her recovery from severe dyspnoea. It is later found that her mother (34 years), her grandfather (74 years), and her sister (4 years) all have the same condition. Each one had a harsh, quavering voice, high-pitched and weaker than normal. The female subjects suffered fom difficulty in breathing and inspiratory stridor. *(Authors' summary)*

1588. NEMEC, J., The motivation background of hyperkinetic dysphonia in children: a contribution to psychologic research in phoniatry. *Logos*, 4, 1961, 28-31.

Sixty children with hyperkinetic dysphonia and a control group of children with normal voice were tested with the Rosenzweig Picture-Frustration Test to determine whether significant differences in aggressive reactions occur between the two groups. Statistically significant differences were found between the hyperkinetic and control groups in the age groups of 9 to 10 and 11 to 12. These differences occurred in extrapunitive scores. A statistically significant difference was found between boys and girls in the 9 to 10 age category, but this difference was in impunity scores. The author recommends the use of psychotherapy in treatment of this vocal disorder. *(H.L.L.)*

1589. ŠUPÁČEK., I., and LACINA, O., Pneumographic findings in cases of hyperkinetic and spastic dysphonia. *Logos*, 4, 1961, 19-27.

The authors described pathological changes of the respiratory movements during phonation found in 82 cases of hyperkinetic dysphonia and 18 cases of spastic dysphonia. These changes affected primarily abdominal breathing. Several types of these respiratory anomalies are described. It was noted that the particular type of the predominant abnormality is related to the specific clinical findings of the presenting voice disorder. No essential qualitative or quantitaive differences in respiratory patterns were found between the two groups of hyperkinetic and spastic dysphonia. The authors suggest [the term] "spastic phonation syndrome." *(Authors' summary)*

1590. WEIHS, V. H., Beiträge zur Kenntnis und Behandlung von Stimmstörungen. (A contribution to the knowledge and treatment of voice disorders.) *Folia phoniat.*, 13, 1961, 13-55.

The results of spirometric, electroacoustic and radiographis investigation show that hyper- and hypokinetic disorders of the voice in both speaking and singing may be connected with nonphysiological changes of register, constitutionally determined faults in breathing and posture and disordered muscle-tone in the skeletal and respiratory musclature. The volume and carrying-power of the voice is dependent upon a strong component in the 3000 cps. region of the vowel spectrum, which presupposes, physiologically, a correct proportion of head to chest resonance as well as the proper synchronization of the costodiaphragmatic and sterno-costal respiratory movements, or, alternatively, the harmonious interaction of the entire respiratory musculature preparatory to the onset of voice. Of particular importance are the antagonistic anterior and posterior muscles of the neck, which maintain the position of the cervical vertebrae during inspiration, the sterno-cleido-mastoid muscles and the supra- and infra-hyoid muscle groups. This

muscle balance, which can be registered by EMG brings about a relaxation of the extrinsic laryngeal musculature and that of the tongue, facilitating a balance of registers and the processes of articulation, strengthening the power and resonance of the voice and improving the use of breath for phonation. Furthermore, the change in the position of the hyoid and the bony larynx together with the epiglottis-laryngeal fat-body mechanism exerts a favourable influence upon the abduction, mode of vibration and adduction of the vocal cords, even in cases of paresis. Seven pages of tables. 65 references. *(Authors' summary)*

GENERAL

1591. BARBARA, D. A., (Ed.) Psychological and psychiatric aspects of speech and hearing. Springfield, Ill.: Charles C Thomas, 1960. Pp 756.

This volume is an attempt to foster an understanding and knowledge of the psychological process involved in the origin, comprehension, and treatment of speech, hearing, and communication disorders. 25 authors have contributed chapters to this volume. Each chapter is a treatise in itself. A broad, eclectic viewpoint has been attempted by pooling the various disciplines including psychiatry, speech pathology, speech teaching, psychology, neurology and social work. The 30 chapters contained in the book cover the psychiatric and psychological aspects of speech and hearing. The book has three main divisions. Part I is concerned with psychological and psychiatric aspects of normal speech and hearing. Part II devotes attention to psychopathology of speech and hearing disorders. Part III concerns itself with psychotherapy of speech and hearing disorders. Because of the psychological orientation stressed throughout the book, disorders of a purely organic nature were knowingly omitted. *(P.W.N.)*

1592. BAUMAN, S., and ARON, M., Research needs in speech pathology in South Africa. *J. S. African Logopedic Soc.*, 7(1), 1960, 4-7.

Virtually no facilities exist in South Africa for the study and treatment of speech, voice, and hearing disabilities of non-Europeans. Before therapeutic efforts are undertaken, certain factors should be investigated—the influence of bilingualism and polyglotism on the incidence and nature of speech defects, cultural patterns and their relation to stuttering, the incidence of cleft palate among Africans, dysphonic problems and their causes, adaptive and compensatory mechanisms adopted by dysarthrics and dysphasics, hearing problems, and the possible need for different methods of teaching lip reading. Possible cultural or socio-economic factors influencing language development and the causes of reading and spelling difficulties among non-European populations are also suggested as unexplored fields for research. Educational institutions and government agencies should recognize the urgent need for initiating research projects. *(Rehab. Lit.)*

1593. BÉKÉSY, G. v., Are surgical experiments on human subjects necessary? *Laryngoscope*, 71, 1961, 367-376.

Although some diseases (e.g., otosclerosis) are peculiar to humans, much information about their effects on hearing, and about their surgical treatment can be learned from properly integrated animal experiments. Animal experiments which can be more adequately controlled may even yield more valid conclusions than can be derived from treatment of patients. Thus, there may be a reduction in the amount of unsuccessful surgery which is often undertaken for the purpose of deriving new knowledge as much as from the desire to help the patients. *(R.G.)*

1594. BOARDMAN, E., The art and music program at the Institute of Logopedics, Wichita, Kansas. *Cerebral Palsy Rev.*, 22(1), 1961, 8-9, 11.

At the Institute art and music serve a specific communicative developmental function, a concept differing from the traditional therapeutic approach directed mainly toward psychotherapeutic goals. The administration of the two programs and the philosophy upon which this particular use of music and art is based are discussed. Emphasis of the programs is on the communicative process involved, rather than on the artistic results achieved. *(Rehab. Lit.)*

1595. BOOMER, D. S., and GOODRICH, D. W., Speech disturbance and judged anxiety. *J. consult. Psychol.*, 25, 1961, 160-164.

This research was an attempt to repeat a pioneering study by Mahl (1956), in which he demonstrated that the incidence of certain disturbances of speech increased during portions of psychotherapy interviews judged to be anxious, and decreased during portions judged less anxious. The results of the present test were inconclusive. The anxiety judgments for one patient made by her therapist supported Mahl's finding, but in a second case the judgments made by the therapist failed of replication. The judgments made by five additional judges who were not the patients' therapists uniformly failed to show the hypothesized relationship to the speech disturbance measures. Reconciliation of these results must await further research. *(Authors' summary)*

1596. CARNELL, C. M., Jr., The speech clinician's role in the community. *Asha*, 3, 1961, 209-211.

The preparation and maintenance of a climate conducive to an effective program in a community is one of the essential functions of the speech clinician. This is emphasized by the fact that in many communities the speech clinician may operate alone and, thus, be the sole representative of the profession. The essentials in a training program which could contribute to the development of community programs are discussed. Superior abilities in the area of oral communication are necessary for all speech and hearing clinicians. *(S.H.A.)*

1597. CASANOVAS, J., Fenomenos sinestesicos anditivo-visuales. (Audiovisual synesthetic phonemona.) *Acta oto-rino-laringol. Ibero-Amer.*, 12, 1961, 81-101.

Synesthesia is the double sensory reaction corresponding to a unique stimulus. The most frequent one is the auditive-photosthesia, or phonopsia, or "colored audition." The author shows a series of examples and his investigation in this field. *(Author's summary)*

1598. KJELDERGAARD, P. M., The psychology of language. *Rev. educ. Res.*, 31, 1961, 119-129.

The author reviews the literature since 1958. Under *theories*, he discusses learning experiences in which a response shared in common by two experiences is said to mediate new learning. He divides mediation theorists into those who emphasize neural consequences of previously learned responses affecting new learning and those who describe implicit responses as a kind of verbal association. Under *research techniques*, he reports that responses on word-association tests are affected by cultural changes, context, instructions, form classes of stimulus-words, and judged similarity between stimuli. Associative clustering is a technique now being used to study how subjects organize lists of words, not in a random way, but in categories, and this organization may precede the learning of them. Also, the semantic-differential scale on which subjects rate concepts on a bipolar basis as good-bad, etc., is becoming a general research tool. Under *verbal learning*, results indicate that it is more important to distribute practice periods when material is less meaningful. Learning of series of paired-words is faster after familiarization with heterogeneous than homogeneous pairs. The role of meaningfulness has been studied, showing meaningfulness of response terms to be more important than meaningfulness of stimulus terms. One finding with educational implications is that there is no difference in speed between learning a list on which a new word-pair is substituted each time a mistake is made and a list that is simply repeated until learned. Other evidence suggests that some learning can occur in a single trial. Under *linguistics and psychology*, his summary indicates slow progress in this area. Some findings are that syntactic structure is affected severely by subtle changes in direction, and that projective test categories can be scored on the basis of grammar. Form class of words, position in sentence, and sentence length affected subjects' ability to supply words deleted from sentences. Heterogeneous items elicited a broader vocabulary than homogeneous ones on a test of the effect of feedback on some linguistic variables. Little evidence was produced for the linguistic relativity hypothesis of Sapir and Whorf. One study suggests that language does predispose us toward certain discriminations in sorting, classifying or problem-solving, even though language does not mold our perceptions. *(R.W.A.)*

1599. LOVAAS, O. I., Interaction between verbal and nonverbal behavior. *Child Develpmt*, 32, 1961, 329-336.

The purpose of this study, as stated by the author, "was to determine the effect of strengthening one class of verbal responses on a class of nonverbal responses." Fourteen children between the ages of 3-5 and 4-7 were introduced to two toys, one "aggressive" and the other "nonaggressive." The aggressive toy was a two-doll apparatus arranged so that one doll would strike the other when the child depressed a lever. The nonaggressive toy was a ball, which could be flipped up and down inside a cage when a lever was depressed by the child. Each child was allowed to play with the toys for a three-minute period prior to the experiment. After this, the toys were removed from sight and each child was encouraged to talk about the dolls. For seven of the children (AV group) aggressive verbal behavior (i.e., "bad doll," "dirty doll") was reinforced, while verbal behavior other than aggressive (i.e., "good doll") was reinforced for a matched control group (NAV group) of the remaining seven children. Reinforcement was in the form of small trinkets presented to the children through a chute. After the desired verbal response was conditioned (within 14 minutes for all subjects), the doll apparatus and the ball were reintroduced and the child was allowed to play with them for four minutes. This concluded the experiment. It was found that the AV group spent significantly more time with the aggressive doll apparatus in the final four minute period than did the NAV group. Four possibilities are considered by the author in a discussion evaluating the results of the study. *(J.W.H.)*

1600. MOWRER, O. H., Relations between speech and psychology: Accomplishment and aspiration. *Cent. States Speech J.*, 12, 1961, 165-169.

The general relationships between the two disciplines Speech and Psychology are explored. The problem of aphasia suggests an area for clinical studies of abnormal language behavior which provide a foundation for broad conceptions of human symbolic processes. The work of Lee, Black, Schuell, and Bluemel is cited for its concern with memory, cognition, image and knowledge. *(J.B.R.)*

1601. PIMSLEUR, P., and BONKOWSKI, R. J., Transfer of verbal material across sense modalities. *J. educ. Psychol.*, 52, 1961, 104-107.

A list of 10 paired associates (disyllables as stimuli and color names as responses) was randomly presented first through one modality and then through another modality. Half the subjects learned the first list through the visual modality and then relearned it through the auditory modality. The other half learned the list in the opposite order. Positive transfer was found in both directions. It was suggested that the aural presentation had agreater facilitating effect upon the visual presentation than conversely. The subjects took fewer total trials to learn verbal material both visually and aurally when the material was presented first aurally and then visually. These findings seemingly offer some support for the view that aural instruction preceding visual instruction may have advantage over conventional methods of language teaching if the goal is to achieve proficiency in both reading and aural comprehension. *(Authors' summary)*

1602. REISS, S., Language as a psychological phenomenon. *Psychiat. Quart.*, 35, 1961, 140-155.

The author poses the question, "What is the nature of word-sounds and the link which associates them with their meaning or meanings?" The author believes that this question can only be answered by regarding the language phenomenon as a psychological product of the human mentality. His method is based on the application to their fullest logical extent of the concepts of sound resemblance and meaning resemblance between the words in the native vocabulary of a language. *(B.S.S.)*

1603. SHAMES, G. H., Private practice in speech pathology in addition to full-time service on a university faculty. *Asha*, 3, 1961, 211-213.

Private practice as an adjunct to a full-time university faculty position is considered from the standpoint of values, ethics, training, economics, and its relation to the profession. This kind of private practice may make it possible for improved clinical services to be available and provide material which can be used for teaching purposes. It also may provide a stimulation for hypothesizing and asking questions to be utilized in research activities. It is im-

portant that, if the field is to develop as a service profession, private practice must be recognized as a legitimate and respectable occupation. Both positive and negative factors are discussed. A fine balance among the professor's interest, the conditions and attitudes at his university, and the local professional climate and receptivity should be maintained. *(S.H.A.)*

1604. YOUNGERMAN, H. C., Speech and hearing certification in New York State. *Asha*, 3, 1961, 185-186.

This is a brief discussion of previous New York certification programs and relationships of the certification to ASHA certification. The requirements for professional education and the specific requirements for permanent and provisional certificates are included. *(S.H.A.)*

AUTHOR INDEX

(Figures Refer to Abstract Numbers)

SUBJECT INDEX

Volume I

(Numbers after each entry refer to numbers of the abstracts)